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THE GAS JOURNAL

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A Glance at the Contents—

Gas Switches.

In our Correspondence Columns Mr. J. H. G. Horstmann urges the gas industry to take full advantage of present equipment for operating gas burners from a distance.

Arrest of Nottingham Gas Official.

Together with a local builder, Mr. L. W. G. Ball, of the Nottingham Corporation Gas Department, has been arrested on a charge of stealing sums of money from the Municipality.

New Works Canteen at Wakefield.

On Saturday, Oct. 4, a new Canteen was opened at the Wakefield Gas-Works by Mr. G. A. Moorhouse, J.P., Chairman of the Wakefield Gaslight Company. A well-equipped kitchen, with up-to-date gas appliances, is a feature of the premises, which are designed to accommodate some eighty people.

Two New Publications Reviewed.

Two new publications briefly reviewed in our "New Books" section this week are "The Patents, Designs, and Trade Marks Acts," by H. Fletcher Moulton and J. H. Evans-Jackson; and "Recent Advances in Analytical Chemistry," Vol. I., edited by C. A. Mitchell, and published by J. & A. Churchill, at 12s. 6d. net.

Fine Gas Showrooms at Leatherhead.

An excellent example of modern gas showroom practice is described and illustrated in an article to-day on the new premises of the Leatherhead Gas Company. These were opened early this year, and they occupy a prominent position on a corner site in the centre of the town. In the same building are also the offices and stores of the Company.

Uniform Calorific Value.

In an article on this subject to-day, our contributors maintain that the best interests of the gas industry lie in a slackening, not a tightening, of legislative shackles. It is stated that we cannot have a "National" Standard except by compulsion of statute. It is self-evident that if a uniform quality in particular areas is desired, it does not need the lash of a "National" Standard to promote that end.

Rating a Gas Company.

The Hertfordshire Assessment Appeals Committee some weeks ago had an exceptionally complicated case to consider in the appeal by the Watford and St. Albans Gas Company against the amount of the assessment of the gas undertaking in the rating area of St. Albans City and Rural District. The assessment of the undertaking had already been reduced from £6000 to £4000, and the Company wanted a further reduction to £2520 or thereabouts. Sir Joseph Priestley, K.C., was in the chair, and the case took up the greater part of a two-days' sitting.

London Gas Companies' Working Agreement.

In the Stock Market Report this week the announcement is made that the Board of Trade has approved of the working agreement entered into between the South Metropolitan Gas Company and the Commercial Gas Company.

In Honour of Sir Francis Goodenough, C.B.E.

There was a large and enthusiastic gathering on Tuesday evening of last week, in the Edward VII. Rooms of the Hotel Victoria, Northumberland Avenue, London, where the Incorporated Sales Managers' Association of the United Kingdom had arranged a dinner to celebrate the honour of Knighthood which has been conferred upon Sir Francis Goodenough, C.B.E., the Association's President. In addition to members of the Association, many friends were present to pay tribute to the guest of honour. Viscount Burnham presided.

Glover-West Verticals in Brittany.

Described on a later page to-day is an installation of Glover-West verticals of novel design at Vannes, a town of some 23,500 inhabitants in Brittany. This new bench comprises three settings each of two retorts of the Glover-West standard type. Two of these settings only are sufficient for the existing demand of about 4000 cub.m. The other setting serves as reserve in case of increase of demand and during repairs. The total capacity of the bench when the three settings are under fire would be 7200 cub.m.; but a further expansion can be readily carried out without interfering with manufacture.

Presidential Address of A. E. Ruffhead.

In his Presidential Address before the North of England Gas Managers' Association, Mr. A. E. Ruffhead says that it is 27 years since the Association were at Darlington, when his predecessor, Mr. Frank P. Tarratt, delivered his Presidential Address. Mr. Ruffhead goes on to speak of some of the difficulties the gas managers of the past had to contend with, unaided as they were by all the various Associations and Councils to aid them in their problems. He urges the younger members, however, not to be content to be "spoon fed," but to think and act for themselves in spite of all the existing organizations of which they can take advantage.

The Gas Unit.

Simplification in nomenclature and the least possible number of terms are desirable, writes Mr. Saml. B. Chandler in our Correspondence Columns to-day. "There does not appear to be any cogent reason why the proposed gas unit should not be adopted as a measure of convenience, but it does not seem desirable to introduce any new term officially—one has recollections of the reception accorded when the change-over from cubic feet to therms took place; and the introduction of any further unit of measurement should be very gravely considered. I am not so sure that even now the average consumer is quite *au fait* with the therm; certainly he is very undecided as to the electrical basis of measurement."

EDITORIAL NOTES

B.C.G.A. Annual Conference

As will have been noted from the detailed programme reproduced in last week's issue of the "JOURNAL," there is every promise of a highly profitable, and enjoyable, time when, from Oct. 27 to 29, the British Commercial Gas Association assemble for their nineteenth annual general meeting and conference at Hull and Bridlington, under the Presidency of Mr. Henry Woodall, J.P., M.Inst.C.E., Chairman of the British Gas Light Company, Ltd. A large attendance, therefore, may be confidently expected, and those who have not already completed their arrangements should do so without further delay. The subjects to be dealt with are of the first importance to the progress of the industry, and they will be submitted by those who are in a position to speak with authority.

Listening to the Presidential Address of Mr. Henry Woodall, the thoughts of many will doubtless go back to 1912, when his father, the late Sir Corbet Woodall, presided in Manchester over the first conference of the Association, and some, perhaps, may recall a sentence in the address on that occasion in which Sir Corbet Woodall, referring to the Association, said: "I find in it a means of greatly widening and extending our usefulness to the community—not merely increasing our business and income." These few words state the policy which has been so successfully followed during all the intervening years, and which we know continues under the Presidency of Mr. Henry Woodall. It is to Service that the Association's activities are directed, in the programme for the forthcoming conference no less than in those that have gone before.

Features particular to this occasion will be the presentation of the promised scheme for the education of the gas salesman, and a complimentary luncheon to Sir Francis Goodenough, C.B.E. It is a meeting not to be missed.

Against the Halfpenny Unit

ELECTRICAL competition in Darlington is certainly severe. With a service charge of only 2s. 3d. a quarter, which includes meter rent, current is sold for lighting during summer at ½d. a unit, and in winter at 3d.; for domestic heating and cooking, the corresponding charges are ½d. and 1¼d.; while the charge for all domestic purposes from 11 p.m. to 7 a.m. is ¾d. a unit, *plus* the rental for a time-switch. It is obvious, then, that the Darlington Gas Undertaking has something formidable to face; and that its progress is maintained demonstrates once again that electricity cannot oust efficient gas service. "Efficient" is important, as Mr. A. E. Ruffhead, Engineer and Manager to the Darlington Gas Department, has long recognized; it accounts for the optimistic tone of his Presidential Address to the North of England Gas Managers' Association delivered on Friday last and published on later pages of our issue to-day. "The Darlington Gas Undertaking," he observes, "is more than holding its own against, I understand, the cheapest rates for electricity in the country; and the secret, I believe, of maintaining that hold will be Service to the Consumer."

Apart from a glimpse into the early history of the undertaking, Mr. Ruffhead's address is an explanation of this service. Taking as a comparison the year 1923, he mentions that the amount of gas sold per annum has more than doubled, while the quantity of coal carbonized has increased by only one-seventh. This is one side of efficient service, and indicates in part why it is that the charge for gas in Darlington, for domestic heating, cooking, and so on, is only 6d. a therm. The other phase of the service is to be found in consumers' premises. Every cooker fixed, for instance, is followed up by a lady cookery demonstrator; every prepayment consumer comes under a "free" maintenance scheme; every fire is periodically inspected; once in three years every consumer's meter is tested *in situ*—to mention a few of the service methods of the Darlington Gas Department, chief among which, however, is to our mind the care taken to ensure that all consumers may enjoy the benefits of thoroughly modern appliances. On this matter, Mr. Ruffhead mentions that modern apparatus has an inevitable effect on the consumption of gas per consumer; but it has also the effect of strengthening the case for gas against the halfpenny unit. With modern equipment, the halfpenny unit is dearer to the user than the sixpenny therm. This constitutes a major factor in the competition of gas and electricity, for the vast majority of people to-day are bound to live economically, and have not the money to spend on a newer form of energy which gives them a service no more satisfactory than that rendered by gas—and gas has not failed them.

There can only be full agreement with Mr. Ruffhead when he insists that the public should be led to understand the fact that gas has not failed them in any way. Even the switch argument does not hold to-day, for there are reliable by-pass gas switches on the market, both for lighting and heating; there is thermostatic control for practically every purpose for which gas is used; there is the new therapeutic radiant, the new hot water storage; and Mr. Ruffhead calls attention to the fact that a gas switch without a by-pass is now a practical proposition. Hence his plea that every available means—advertisement in newspapers, by showrooms, through the personnel of the undertakings—should be employed to disseminate this information. The case for gas is one which demands advertisement and lends itself to it to an astonishing degree, for it is a fuel which fulfils all requirements of the modern householder.

Gas manufacture and distribution are much more complex to-day than they were twenty-seven years ago, when Mr. Ruffhead took up his duties at Darlington; but side by side with this complexity have developed facilities for meeting obstacles. The President points to the advantages offered by such organizations as the National Gas Council, the British Commercial Gas Association, and the Federation of Gas Employers; in the past, too, gas engineers had not the benefits of research work such as is undertaken by the Institution of Gas Engineers. Full advantage should, of course, be taken of all these organizations; but, above all, the industry needs men who can think for themselves and are imbued with the ambitions and resources of mind of the earlier engineers responsible for the industry's progress. And Mr. Ruffhead rightly urges younger members of our industry not to rest content with "spoon-feeding"—which is wholly insufficient protection in the turmoil of halfpenny unit days.

An "A.G.A." Publication

WE would call the attention of our readers to a remarkable book on water heating which has lately been published by the American Gas Association, under the Editorship of Mr. C. George Seyler. It deals with the application of gas to water heating from both economic and technical viewpoints, and it includes new data on water piping, hot water demand, and the selection of the proper equipment to fit any given situation. The price of this reference book, which has been prepared under the supervision of the Committee on Large Volume Water Heating of the Industrial Gas Section of the "A.G.A.," is $3 to non-members of the Association—a sum which certainly represents unusual value. Gas can render a wonderful service in the water heating field; and the information contained in this book will be of great assistance to those through whose efforts the public may enjoy the comfort and benefit of gas-heated water. To speed the day of the higher standard of living which extended usage of gaseous fuel spells, engineers, plumbers, architects, and builders must be provided with technical in-

formation on the latest methods of applying gas to hot water systems. Those in our industry responsible for gas water heater sales must know thoroughly the benefits of gas to the potential consumer, as well as methods of selecting the most suitable size and type of system for the work to be done; and in this regard publications such as the one under review are of the greatest importance.

There is every reason to be enthusiastic about the prospects of gas in the water heating field, which, when all is said and done, is almost virgin ground. Wherever coal storage space is at a premium, it should be possible to prepare a favourable cost analysis indicating how the use of gas can effect economy. The space formerly required for solid fuel storage can be used for other purposes. Many instances of this kind exist, in every town, in such buildings as banks, clubs, stores, and so on; and another group of consumers is to be found among the owners and managers of buildings in which poor hot water service is being furnished by solid fuel fired heaters. These situations ought to be known to every gas undertaking; and the first step in tackling the water heating load is to carry out a general survey, obtaining a list of all buildings in each class which might become gas consumers. By this information it becomes possible to estimate the marketing possibilities, to gain a rough idea of increased gas sales, and to ascertain at what rate gas would have to be sold in particular areas to compete with other fuels. This general survey must not be confused with a detailed survey, which is the next step.

In the hot water field it is not necessary to sell gas on a B.Th.U. for B.Th.U. basis with other fuels in order to compete successfully. If we can show the customer methods of substantially reducing his hot water consumption without reducing his comfort, methods of saving heat losses from his system, or methods of making the entire layout more efficient, the sale of gas becomes very much easier. All sorts of questions are asked in the "A.G.A." book, to suggest the various avenues of approach to discover means for effecting economy. For example, can spring taps be employed in order to make it necessary to hold the tap open when hot water is desired? Can thermotstatic mixing valves be employed to advantage? Are the boiler and tank, and the hot water and return circulating lines insulated? Is the thermostat set at the temperature which will give the lowest bills?

Gas Rates for Water Heating

ANOTHER method for popularizing gas at the end of each quarter is, of course, scientific rating; and we are in complete agreement with the "A.G.A." Committee that the water heating load, especially in the summer time, represents a type of business for which a special rate might often be profitably adopted. Gas undertakings having a winter peak load now existing, and threatening to become more pronounced, due to the growth of the gas fire business, are faced with the problem of filling in the valley in the gas sales curve occurring in the summer time. Both manufacturing plant and distribution system are operating with a poor load factor during the summer or valley months, and for this reason it seems only fair to urge the adoption of rates for large volume water heating based on the increment of gas. This means the adoption of a rate in which a major portion of the fixed charges is not included, on the theory that the existing business will carry the greater part.

To determine at what rate gas should be sold to be competitive for large-scale water heating, many typical coal and oil installations were investigated by the "A.G.A." Committee. Now gas is a uniform fuel, and it is automatic in action; no matter how exacting the service or how unusual the demands for hot water, gas stands ready to supply the needs. These differences, among others, will be recognized by every prospective customer; and we ought to make every effort to bring these points home to the customer to show him that the premium which he may pay over the cost of solid fuel is far less than the increased value of the service which he receives. This premium is necessarily determined by local circumstances; but the "A.G.A." suggests, as a result of the investigations, that a premium from 10 to 25 p.ct. may safely be added to the all-in cost of obtaining hot water by solid fuel. "It represents an average amount that the customer is willing to pay for the superiority of gas." The question, then, resolves itself into the adoption of suitable rates; and there appears to be no reason why, during the summer time, such rates should not be possible. In this connection we would call attention to the new scale of water heating rates which has been adopted by the Halifax Gas Committee this week. All gas used for this purpose during the summer months is to be charged for at ¼d. a "Unit," less 25 p.ct., the "Unit" being 4000 B.Th.U. Would it not also pay undertakings generally to consider the night-time valleys in gas utilization from the angle of special rates for night burning only?

Unemployment Grants

REFERENCE has been made in these columns to the vexed subject of the taxation of Treasury Grants approved by the Unemployment Grants Committee. In May last, we had occasion to deplore the ruling given in the Seaham Harbour case—as a result of which the Government's promised contribution towards the cost of expediting and carrying out work with a view to the relief of unemployment has been held to be liable to income-tax. That such sums should be regarded as taxable income, in the assessment of public utility undertakings and other concerns endeavouring to co-operate with the State in embarking upon schemes involving the employment of otherwise unemployed labour, would certainly appear to militate against, rather than to encourage, such excellent schemes.

It is with some misgivings, therefore, that we note from a report of a case heard in the Aberdeenshire Valuation Appeal Court on Sept. 12 that an attempt is being made to bring such receipts into account for the purposes of local rating. On this point the Fraserburgh Harbour Commissioners appealed, although there was no dispute as to the other items of the assessment of £11,097 which had been computed on the profits principle applicable to gas, water, and other public utilities.

The Harbour Commissioners had been for some years in receipt of an annual sum representing 50 p.ct. of the interest on a loan raised for the purpose of financing the building of a new slipway, and contended that, as such, it was not a proper addition to the rateable value of the undertaking. The Assessor, while admitting that the grant had not been included in previous rating assessments, substantiated his right to take this item of revenue into account on the ground that the application of the income (in this instance to meet the interest charges) was, according to established case law, irrelevant. He also suggested that, but for the Government Grant, the rates and dues levied by the Harbour Authority must have been increased to provide for the loan interest, and that this additional revenue would have affected the valuation. In our view, it is not correct to assume the dues which might have been charged; a rating valuation, it is suggested, is to be based on the existing conditions, and not on probabilities.

The Court, by a majority, dismissed the appeal; and having regard to the effect of the decision if applied generally to undertakings in receipt of similar grants, it is interesting to note that, on behalf of the Harbour Commissioners, dissatisfaction was expressed with the finding of the Court. This procedure enables the case to be stated for the Opinion of the High Court, if the Commissioners are agreeable to taking this course. That further action should be taken is to be desired, in view of the fact disclosed during the hearing of the Stirlingshire and Falkirk Water Board case before the Stirlingshire Valuation Appeal Court (which sustained the appeal on a similar point; as did also the Falkirk Burgh Valuation Appeal Court) the previous week. While the Assessor in the case is reported to have expressed his personal view that the grants should not be assessed, he added that other Assessors in the country were of the opinion that they should be included in the valuation. That the majority opinion of a body of officials—however highly skilled in their profession—should govern the valuation of properties appears an intolerable position.

Remember the Street Lighting.

The following remarks appropriately find a place in the September issue of the City of Birmingham "Gas Department Magazine:" "The approach of winter, coupled with the ever-increasing volume of fast traffic on our roads, has served to focus public attention on the question of street lighting. Although great progress in the illumination of public thoroughfares has been made in recent years, there is little doubt but that still more rapid improvement will take place in the next few years. Gas lighting, because of its reliability, its economy, and its excellent diffusing power, is peculiarly suitable for street lighting—there are to-day 635,000 gas street lamps in use in England and Wales. In Birmingham alone there are 660 miles of gas-lighted roads. . . . The facts show that wherever gas is submitted to unprejudiced tests by experts, its use will extend; and the introduction of up-to-date lamps and burners will be welcomed by all users of the road. Efficient street lighting must always be dependent very largely on how much money the community is able to allocate to this service; but it must be a great satisfaction to all of us whose livelihoods are linked up with the prosperity of the gas industry to know that, given a fair field and no favour, the modern gas lamp can meet all competitors."

As Others See Us.

Contributing to a discussion in the "Electrical Times" on the point as to whether more independent electrical plant is at present being installed, Mr. F. W. Purse, Chief Engineer to the London and Home Counties Joint Electricity Authority, expresses the opinion that anything in this way is only a passing fancy, and that electricity derived from the public supply mains will assert itself in due course. To achieve this, however, the method "must be found within rather than without." To point the moral of what he says, Mr. Purse pays the following tribute to the attitude of the gas industry towards competition: "When the public electricity supply really got into its stride, we did not see our gas friends sitting down and bemoaning the fact that they were being pushed out of the picture. They set to work by amalgamating the resources of the manufacturing interests and of the gas distributing companies, with the result that they have not only held their own, but added a little bit more as well."

Are We Ready?

The present industrial depression, like the war and the more recent coal strike, is having its ill effect on the gas industry; but, fortunately, in spite of the trade depression, the consumption of gas continues to increase slightly in almost every town throughout the country. The revival which must come will probably be sudden in its appearance. It will have been stimulated by Empire Conferences and Agreements, by Parliamentary Elections and by public revulsion against "dole" and other influences which encourage the lazy in their idleness. The ill effect on the gas industry is noticeably marked by the postponement of works development by those in control of the purse strings; but when the big demand comes, will those undertakings who are holding back be in a position to take full advantage of the revival, and be able, without risk of failure, to meet the increased demand upon their restricted resources? During the war, many gas-works fell into an unsatisfactory state of repair, which had to be rectified afterwards at great expense. During the coal strike, gas-works were strained to the utmost to maintain supplies of gas with the poor gas-making material then available. They won through after great expenditure which could not be avoided. During the present trade depression gas undertakings are waiting for developments, but when these do arrive, will all undertakings be able to meet their obligations without delay and consequent loss of opportunities? Extensions and improvements should be considered now, and orders placed while work is scarce and prices low. It seems folly to wait for the boom in trade, when prices will be high and plant and apparatus unobtainable on short notice on account of heavy demands then made upon the manufacturers. There is also the point that new plant installed now would produce economies in manufacture which would be invaluable at the present time.

Cost of Advertisements and Rating.

While the general publicity for the gas industry is carried out in a collective manner by the British Commercial Gas Association, most undertakings find it necessary or desirable to supplement this by local advertising. It is therefore not without interest to note that the North Middlesex Assessment Committee recently dealt with this question in the rating of certain garages. The Rating and Valuation Officer for Hornsey refuted the contention of the owner that the advertising of the garages was necessary to the letting of the premises, by directing attention to the definition of expenses deductible from the rental value and allowing only such expenses as were necessary to maintain the hereditament. It is understood that the Committee did not express a definite opinion on the point, although they upheld the assessment made by the Rating Authority. The rating of public utility undertakings of necessity materially differs from the valuation of other classes of hereditaments, but the principle involved in this question would appear to be of almost universal application, and may lead to further consideration being given to the subject.

FORTHCOMING ENGAGEMENTS

Oct. 10.—Manchester District Institution of Gas Engineers.—Visit to the Partington Gas-Works.

Oct. 13.—Institution of Gas Engineers.—Meetings of Executive Committee, 2 p.m.; Finance Sub-Committee, 3 p.m.; Finance Committee, 4 p.m.; Benevolent Fund Committee, 4.30 p.m.; Sub-Committee on Salaries of Gas Engineers, 4.45 p.m., at 28, Grosvenor Gardens, S.W. 1.

Oct. 14.—National Gas Council.—Meeting of Central Executive Board, at 28, Grosvenor Gardens, 2.30 p.m.

Oct. 14.—Institution of Gas Engineers.—Meeting of Council, 10 a.m.; Purifiers Sub-Committee, 12.45 p.m.; Meters Sub-Committee, 4.15 p.m.; 28, Grosvenor Gardens, S.W. 1.

Oct. 15.—Institution of Gas Engineers.—Meeting of Corrosion of Pipes Sub-Committee, 2.30 p.m., at 28, Grosvenor Gardens, S.W. 1.

Oct. 15.—British Commercial Gas Association.—General Committee Meeting.

Oct. 15.—Eastern Counties Gas Managers' Association.—Autumn Meeting at the Holborn Restaurant, 2.15 p.m.

Oct. 16.—Society of British Gas Industries.—Meeting of the Council in the afternoon.

Oct. 18.—Yorkshire Junior Gas Association.—Annual General Meeting in the Lecture Room of the Fuel Department of the Leeds University, 3.15 p.m.

Oct. 20.—Institution of Gas Engineers.—Meeting of Joint Committee of the Institution and Leeds University, 2.15 p.m., at 28, Grosvenor Gardens, S.W. 1.

Oct. 21.—Institution of Gas Engineers.—Meetings of Liquor Effluents Sub-Committee, 10 a.m.; Ammonia Sub-Committee, 11.30 a.m.; General Research Committee, 2.15 p.m., at 28, Grosvenor Gardens, S.W. 1.

Oct. 22.—Southern Association of Gas Engineers and Managers (Eastern District).—Committee Meeting 11 a.m., General Meeting 2 p.m., at 28, Grosvenor Gardens, Westminster, S.W. 1.

Oct. 22-23.—Institute of Fuel.—Annual Conference at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 2. Annual Dinner at the Connaught Rooms, Great Queen Street, W.C. 2, on Oct. 22.

Oct. 23.—Coke Oven Managers' Association.—Annual Dinner at the Hotel Great Central.

Oct. 25.—Midland Junior Gas Association.—Visit to Works of Messrs. C. & W. Walker, Ltd., Donnington, Salop.

Oct. 25.—Scottish Junior Gas Association (Eastern District).—Visit to Messrs. Henry Balfour & Co., Ltd., Leven.

Oct. 27 to 29.—British Commercial Gas Association.—Annual Meeting at Hull and Bridlington.

Nov. 19.—Society of British Gas Industries.—Autumn General Meeting in London.

Nov. 21.—Southern Association of Gas Engineers and Managers.—General Meeting in London.

Nov. 25-26.—Institution of Gas Engineers.—Autumn Meeting at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 2.

CORRESPONDENCE

The Gas Unit.

SIR,—In these days of competition, and to prepare for those which lie before the industry, if anything can be done to simplify methods of comparison when considering the merits of gas and other forms of fuel, the potentialities of new terms of measurements might with advantage be considered and investigated.

The letter which appeared in your columns from Radiation Ltd., suggesting a smaller selling unit, outlined certain reasons for the adoption by the industry of something a little less unwieldy (when used as a method of comparison) than the therm; and certainly a unit of 4000 B.Th.U. would bring the relationship between gas and electricity more in line, and might possibly simplify calculations. Many gas salesmen, however, still think in terms of cubic feet, and experience no difficulty in giving comparative figures when called upon to do so.

The therm, although a large unit, can quite simply be compared, and the presentation to the public of a further new unit in the form suggested might lead to some confusion in the mind of the consumer, for, while advertisements and general propaganada material would state "gas unit," accounts would still be rendered in therms, and a very careful explanation would always have to be given to the consumer in order to get him to connect the two terms.

Simplification in nomenclature and the least possible number of terms are desirable. There does not appear to be any cogent reason why the proposed gas unit should not be adopted as a measure of convenience, but it does not seem desirable to introduce any new term officially—one has recollections of the reception accorded when the change-over from cubic feet to therms took place; and the introduction of any further unit of measurement should be very gravely considered. I am not so sure that even now the average consumer is quite *au fait* with the therm; certainly he is very undecided as to the electrical basis of measurement.

Makers themselves invariably quote consumptions in cubic feet, and, in doing so, usually omit to state the calorific value of the gas used in obtaining results. How much better to base data on B.Th.U. emission, and thus perhaps prepare the way to the logical use of the proposed new form.

SAMUEL B. CHANDLER,
M.Inst.Gas E., A.M.I.Mech.E.

Tottenham, N. 17.
Oct. 1, 1930.

SIR,—With the broad principle that there should be a measure of gas which is in closer relationship to the measure used by its chief competitors there can be no two opinions in the gas industry. Messrs. Radiation are to be congratulated in voicing a conclusion widely felt, and more especially upon accompanying it with a suggestion, and reasons therefor, which provide a basis for constructive discussion.

Messrs. Radiation suggest a "unit" of 4000 B.Th.U. It may be recalled that others have urged a measure of 3412 B.Th.U., so as to be exactly parallel with its electrical prototype. In selecting 4000 B.Th.U. Messrs. Radiation have obviously been influenced by the desire to obtain a whole-number divisor into the therm (or multiplier when converting into "units"); but they introduce a new figure from which comparisons are now spared. If this can be avoided it should be, and for that reason the writer is with those who would go the "whole hog" of the electrical measure.

Possibly Messrs. Radiation have considered that the difference of 588 B.Th.U. would be a convenient concession to electricity in such cases as comparisons between electric radiators and gas fires for heating. Electricians here claim 100 p.ct. efficiency, whereas the most that gas men care to claim is from 70 to 75 p.ct. (as heating commodity), made up roughly of 50 p.ct. by radiation and 20 to 25 p.ct. in convection currents from the heating structure. But in this connection gas men can also claim 100 p.ct. efficiency, and upon strong grounds, since whatever difference there is between the units imparted to the room and the total is carried to the chimney and performs the excellent, and necessary, function of ventilation. Whenever, then, an electrician was drawn to accuse the "Gas Unit" (3412 B.Th.U.) of being less efficient than the electrical unit (3412 B.Th.U.) the gas man would have not only an adequate retort, but one which gave him the excellent opening of enlarging on the vital need for ventilation, and the ill-service which the electrical appliance affords by ignoring it. Where ventilation is not called for, the gas radiator can vie with electric radiators, and in many circumstances the combustion products can be "piped" away.

It would be extremely desirable, if a "Gas Unit" were adopted, that some means be taken for informing consumers how many units they have had, and what each unit has cost. Whatever "Gas Unit" is employed, the use of decimals cannot be avoided, if not in primary, at least in secondary, calculations. It would be a little more complicated to multiply the therms used by 29·3 (or 29·31 if a second decimal is employed) than by 25·0, but here the convenience of Messrs. Radiation's suggestion ends, and calculation tables would meet the needs even in this regard. As has been observed elsewhere, it would seem there is nothing in law to prevent a gas undertaking, if it cares to do so, from adding to the accounts now rendered (showing the obligatory information as to therms used and their cost) the additional information of the "Gas Units" used and their cost.

In actual competitive conditions, it will be a great convenience to be on level grounds as to the factor of comparison. It may appear that the gas industry can afford to be generous, and so put 17 p.ct. of "overweight" into its unit, but competition will become even keener than it is now, and the loss of that overweight may be felt in the days that are ahead. It is important, therefore, that in considering such a vital matter as a "standard," from which it will be difficult to retreat once it is adopted, there should be no possibility of later regrets.

J. H. BREARLEY.

Wharmton, Harrogate,
Oct. 6, 1929.

Distance Gas Switches.

SIR,—The writer was much interested in the article by Mr. F. Shewring entitled "Self-Help in the Lighting Business" which appeared in your issue of Oct. 1.

Your contributor's remarks with regard to distance gas switches cannot, however, be entirely accepted. While it is agreed that our lead-covered cable is somewhat unsightly when used with standard swan neck wall brackets and inverted burners, this disadvantage may be overcome by screwing the switch cock direct to the existing tap and employing a vertical feed burner (such as Messrs. Sugg's "Elite"). By this means not only is the appearance of the whole fitting greatly improved, but cable fitting is facilitated. For use with drop pendants, it will be agreed that the "Newbridge" lead covered cable can be fitted in a very inconspicuous manner, giving a much neater appearance than the chain, pulley, and falling weight system referred to by Mr. Shewring.

A number of visitors to the writer's house have remarked, on seeing the switch controlled lighting, "I see you've got electric light." Genuine surprise is expressed when they are told that gas lighting is used throughout. This shows that electric lighting is largely associated with switches (and their attendant advantages), and that neither gas wall brackets nor pendants need appear less attractive than the equivalent electric fittings.

As regards the hope expressed by Mr. Shewring that the industry will one day enjoy the advantage of a gas switch without a by-pass, the answer is "Wait and see." In the meantime it is for the good of all concerned—consumers, gas undertakings, and switch manufacturers—to make the most of the best there is available at present.

JOHN H. G. HORSTMANN,
Director.

The Horstmann Gear Company, Ltd.,
Newbridge Works, Bath,
Oct. 4, 1930.

OBITUARY

MR. JAMES DOUGALL.

The death occurred on the 2nd inst. at Forest Row, Sussex, of Mr. James Dougall, of Hill End, Bridle Road, Pinner, in his 60th year.

Mr. Dougall, who was Chairman and Managing Director of Messrs. Dougall's Gas Meters, Ltd., Chiswick, was born at Kidderminster in April, 1871. He was the youngest son of the late Mr. Andrew Dougall, Chief Engineer of the Hull Station of the British Gas Light Company, Ltd. Educated at Hull College, deceased served Articles with Messrs. Clayton, Son, & Co., Gas Engineers, Hunslet, Leeds. He supervised for them several large engineering works, including the erection of a

gasholder for the South Metropolitan Gas Company at East Greenwich, believed at that time to be the largest holder in the world. At the age of 21 he was appointed Gas and Water Engineer at Hoylake and West Kirby, and was considered to be the youngest gas engineer holding a similar appointment in the country. He then became Chief Engineer to the Isle of Thanet Gas Company, where considerable extensions and improvements were carried out by him. In 1905 Mr. Dougall went to South America, and was Chief Engineer to the Buenos Ayres (New) Gas Company. He returned after a period of service there, and accepted an appointment as London Manager to Messrs. Willey & Co., Gas Engineers, of London and Exeter, and remained in that position for fourteen years.

Deceased started in business for himself as a meter manufacturer in March, 1922, and a Company was formed, with Mr. Dougall at the head, to deal with the increased business in January, 1926; and in September of the same year the firm moved to larger premises in Church Wharf, Chiswick, where they are still situated. Mr. Dougall had the support of the Brentford Gas Company, in whose area he started business, and afterwards the Gas Light and Coke Company when they took over the former Company.

Mr. Dougall's three brothers, who pre-deceased him, were Gas Engineers. Mr. Andrew Dougall, Gas Engineer at Tunbridge Wells, was President of the Institution of Gas Engineers in 1903, and the other two brothers were Engineers of the Sevenoaks and Boston Gas Companies respectively. Deceased leaves a widow and son and daughter to mourn his loss.

We understand that it is the intention of the present Directors to carry on the business on the same progressive lines as laid down by the late Mr. Dougall, and they look forward to receiving that same valued measure of support from the large number of gas engineers as was given to their late colleague.

Mr. JOHN LIVINGSTONE, Gas Manager, Tillicoultry, died in the Royal Infirmary, Edinburgh, on Sunday, Sept. 28 last. A native of Paisley, Mr. Livingstone served with that Gas Undertaking. He then had a period of service in England, returning to Scotland to become Works Superintendent of the Airdrie Gas Department. He was appointed to Tillicoultry from Airdrie in December, 1924. Deceased was held in high esteem. The funeral was on Wednesday last from Tillicoultry West Church to Tillicoultry Cemetery, and among those attending were the Chairman and Directors of the Gas Company and members of the Town Council. The North British Association of Gas Managers was represented by the Vice-President, Mr. A. S. Nisbet, Paisley, and the Secretary, Mr. A. Kellock, Airdrie.

PERSONAL

The Birkenhead Corporation Gas Committee have appointed Mr. A. S. HAYNES, of Leeds, as Chief Chemist at the Gas-Works.

Mr. HAROLD E. COPP, M.Inst.C.E., M.Inst.Gas E., President, and Mr. J. R. W. ALEXANDER, M.A., LL.B., Secretary, represented the Institution of Gas Engineers at the Conference of the Society of Incorporated Accountants and Auditors held in Sheffield from Sept. 24 to 27.

Mr. C. S. SHAPLEY, M.I.Mech.E., M.Inst.Gas E., who was accompanied by Mrs. Shapley, represented the Institution of Gas Engineers at the Conference of the Norwegian Gas-Works Association in Trondjhem from Aug. 25 to 27, under the Presidency of Mr. John Charles Irminger, B.Sc., M.Inst.Gas E.

THE NEWS OF THE WEEK

A Loan of £100,000 from the Ministry of Health is to be applied for by the Coventry Gas Committee for the extension of gas mains. This extension is called for by the enlarged area of the City and the development of considerable building operations.

Sir John Cass Coal Carbonization Lectures, as mentioned in the "JOURNAL" last week, are being given this season by H. D. Greenwood, M.Sc., A.I.C., M. A. Matthews, D.Sc., Ph.D., F.I.C., W. Kirby, B.Sc., A.I.C., and G. C. Holliday, B.A. The following special lectures in connection with the course will be given at 8.15 on the dates mentioned: Monday, Oct. 13, "The Work of the Fuel Research Coal Survey," by F. S. Sinnatt, M.B.E., D.Sc., F.I.C. (Chairman, E. V. Evans, O.B.E., F.I.C.); Monday, Oct. 20, "Observations on the Reactivity of Cokes," by Prof. J. W. Cobb, C.B.E., B.Sc. (Chairman, E. W. Smith, C.B.E., D.Sc., F.I.C.); Monday, Nov. 17, "The Hydrogenation of Coal," by J. Ivon Graham, M.A., M.Sc., F.R.C.Sc. (Chairman, H. Hollings, M.Sc., A.I.C.). Admission is free to these special lectures.

The Institute of Fuel will hold a two-day conference on Oct. 22 and 23 in the Incorporated Accountants' Hall, Victoria Embankment, W.C. On Oct. 22 Sir David Milne-Watson, LL.D., D.L., will deliver his Presidential Address; Mr. J. Lubbock, M.A., A.M.I.Mech.E., Chief Engineer, Fuel Oil Technical Department, Shell-Mex, Ltd., will read a paper on "The Industrial Uses of Fuel Oil;" and Dr. E. W. Smith, F.I.C., M.I.Chem.E., will deal with "The Use of Coke Breeze for Industrial Purposes."

The Cost of the Gasholder Accident at Keighley is to be borne in part by the Insurance Company, who have agreed to pay £6478 to the Department. The Gas Committee recommend the acceptance of this offer, together with that of Messrs. Clayton, Son, & Co., Ltd., of Leeds, for dismantling the wrecked holder and supplying in the existing tank a new four-lift holder using the present vertical stays, gusset plates, and carriages, at a cost of £8963. In view of this accident, the practicability of periodically examining the Corporation's gasholders in the future is under consideration.

Five Large Stands were occupied by the Dewsbury Corporation Gas Department at the fourth annual Trades and Fashions Exhibition, promoted by the local Chamber of Trade, and opened at the Town Hall on Sept. 27. The Exhibition comprised almost exclusively the displays of local traders, and the Gas Department had a very comprehensive range of appliances on view, both for domestic and small industrial uses.

Metcalfs (Tar Distillers) was registered on Sept. 25 as a private company with a capital of £80,000 in £1 shares to acquire the undertakings of John Metcalf Chemical Company and William Metcalf, and to carry on the business of chemical manufacturers, &c. The Directors are: G. C. M. Barlow, J. M. Barlow, Samuel Jackson, Sidney Jackson, G. L. Macalpine, J. L. Macalpine, F. G. Macalpine, and W. F. Metcalf. Registered office: Altham, Accrington.

Costing—An Aid to Management.—The Master Cutler-Elect (Mr. P. P. Brown, M.Inst.C.E.) will preside over a meeting of Works' Directors and Business Executives at the Cutlers' Hall, Sheffield, on Friday, Oct. 24, at 2.30 p.m., when a paper on "Why Cost Accounting is Vital to Efficient Management" will be read and discussed. This meeting, which is open to all who are interested, is part of the programme of the Ninth National Cost Conference, which will be held in Sheffield on Oct. 24 and 25, under the auspices of the Institute of Cost and Works Accountants.

The Bradford Gas Department had an extensive display of cookers, fires, heaters, lighting fittings, irons, &c., at a Homes, Industry, and Fashions Exhibition, held at the Olympia Hall, Bradford, from Sept. 24 to Oct. 4, in conjunction with the Wool Fabrics and National Mark Goods campaign being held in the city during the same period. The large Gas Department showroom windows in Darley Street were also attractively set out for the special occasion. At the Exhibition a course of daily cookery lectures were given by Miss N. Longworth, First Class Diplomée and London Gold Medallist in Cookery; and the public took part in a home bread-baking competition for prizes given by the Gas Department.

The Inclusion of Rent of Appliances in the Price of Gas, through the prepayment meters, is a plan recently decided upon by the Shipley Gas Committee, who have prepared the following scheme: That the charge for the hire of cooking stoves supplied with gas through a prepayment meter shall be made by an addition to the charge for gas supplied, and that from the last meter reading in September, 1930, the charge for gas supplied (including the hire of a prepayment meter) will be at the rate of 12½d. per therm (equal to 16 c.ft. per 1d.) being the charge now in force, and that from the last meter reading in September, 1930, the charge for gas supplied, including the hire of a prepayment meter and a cooking stove, will be at the rate of 13⅛d. per therm (equal to 15 c.ft. per 1d.).

Coal as Ships' Fuel was the subject of an address by Sir August Cayzer, President of the Institute of Marine Engineers and Chairman of Cayzer, Irvine, & Co., at a meeting of the Institute recently. He said it was important that coal should continue to be largely used for propelling vessels, that steamers should continue to be built by British owners, and that they should not be superseded by the internal combustion engine, unless and until, by extraction from coal, oil can be obtained to provide fuel for such engines. Shipowners using or contemplating the use of oil on a large scale should bear in mind the fact that international complications, whether Great Britain was involved or not, might raise the price of oil to a ruinous figure, as there was practically no reserve of fuel or Diesel oil in this country. "The utilization of our coal to the best advantage commercially is very important and worthy of serious consideration. It may be that our future fuel, whether solid or liquid, will be obtained from coal after a portion of its more valuable constituents have been economically extracted."

New Gas Rates at Halifax.

"Gas Unit" of 4000 B.Th.U.

At their monthly meeting on Oct. 6 the Halifax Gas Committee unanimously resolved to introduce a Special Purposes Two-Part-Tariff in addition to the General Purposes Two-Part-Tariff which has been such a success. The new tariff is briefly as follows:

Gas for Water Heating and for House or Space Heating—
Domestic, Commercial, and Industrial Premises.

WINTER MONTHS.

Primary rate:
The first part is based upon 360 hours' use per month of the maximum hourly demand. The first part is charged at ¼d. per unit and all gas used in excess of that quantity at ¼d. per unit, *less* 10 p.ct.

SUMMER MONTHS.

All gas used during the six summer months is charged at ¼d. per "Unit," *less* 25 p.ct.

The "Unit" is 4000 B.Th.U.

THE NEWS—continued.

In Honour of Sir Francis Goodenough, C.B.E.

There was a large and enthusiastic gathering on Tuesday evening of last week, in the Edward VII. Rooms of the Hotel Victoria, Northumberland Avenue, London, where the Incorporated Sales Managers' Association of the United Kingdom had arranged a dinner to celebrate the honour of Knighthood which has been conferred upon Sir Francis Goodenough, C.B.E., the Association's President. In addition to members of the Association, many friends were present to pay tribute to the guest of honour; and the autograph of each person attending will be inscribed in an album to be presented to Sir Francis as a permanent souvenir of the occasion.

Viscount BURNHAM, who presided, remarked that nobody could say that Sir Francis had not merited the honour done him, for no one either at home or abroad had deserved better of the country than he, and those who had been associated with him through the whole of his career were the first to acknowledge his worth and his work. He entered the service of the great Company of public utility with which he had always been associated at the age of sixteen, and he had spent 41 years in that service, for 26 years of which time he had been in charge of the sales department. During this period, the service of that Company had been raised to a point which was adopted as an example to public utility undertakings everywhere. For three years he had been Chairman of the Incorporated Sales Managers' Association, of which he was now President. The many other services rendered by Sir Francis to the gas industry and to education, with which readers of the "JOURNAL" are familiar, were enumerated by Viscount Burnham, who went on to say that the opinions of Sir Francis on the subject of salesmanship were recognized as of great weight. He had done an enormous amount for British commerce. In fact, it was not too much to say that in honouring Sir Francis they were honouring the premier salesman of the Empire.

Mr. HERBERT S. MORRISON (Minister of Transport) said that Sir Francis was not only a man of business, but was a philosopher as well. His Company had not submitted tamely to the progress of electricity. Indeed, Sir Francis had done what every undertaking faced with competition ought to do. As a Minister having some connection with electricity, he would say quite frankly that he admired the efficient and courageous way in which Sir Francis and his colleagues had faced their difficulties, and had fought them and had come through the fight. Through his interest in the wider sphere of commerce and industry, Sir Francis had shown himself a servant to British industry as a whole, and he was rightly honoured by the nation as a whole. He liked him as a man, as a business man, and as a "white" man—a man who played the game.

The Rt. Hon. ARTHUR GREENWOOD (Minister of Health) said he had a personal regard for the guest of honour that night. Sir Francis had gone through the hard mill of life, and the position of distinction and eminence which he now enjoyed was due to his own qualities. He had made a great place for himself in the economic life of the country. Sir Francis had taken a broad view of his responsibilities, and all of them ought to be grateful to him for the way in which he had directed and inspired the Government Committee on Education for Salesmanship over which he presided. He had, indeed, contributed greatly to his country's good.

Sir MALCOLM A. ROBERTSON declared Sir Francis to be the greatest protagonist of salesmanship, and salesmanship was the thing to which all the endeavours of the country should be devoted. He possessed great capacity, experience, and enthusiasm. It was a pleasure to be present at the honouring of such a man, because Sir Francis was British, and all that he had done, and all that he had advocated, was British.

Sir FRANCIS, responding to the toast of his health, remarked that he owed a very great debt of gratitude to Sir David Milne-Watson, because if it had not been for his generosity and encouragement, he (the speaker) would never have had the opportunity to do the public work, either for the industry or the country, that it had been his privilege to do. He had worked under Sir David as his Chief for many years, and he could wish no man a better Chief. He thanked Sir David again for the opportunities he had given him, and he also thanked the gas industry for the opportunity of serving it through the "B.C.G.A.," as well as the officers of that Association for the help they had given him. It was no easy task on which the Salesmanship Committee were engaged—that of trying to frame some really useful recommendations for the advancement of education for commerce on its creative and executive sides. It was a complex problem, not to be solved by any Committee, however zealous and energetic, unless they had the aid of both business men and educationists now, and unless this was followed by the thorough co-operation of both in the years to come. They must go on trying to arouse commerce and industry to the fact that they must seek out and attract to their employment the young men of character and ability and keen adventurous spirit, and see that more of them were educated aright for the glorious game of commerce, and were given fitting rewards for their efforts,

THE NEWS—continued.

or "we shall prove ourselves unworthy of our ancestors, who were the gallant pioneers of British trade, and shall sink back into the lesser range of the world's industrial nations."

Sir DAVID MILNE-WATSON, who proposed the health of the Chairman, said that it had been a most successful gathering on a very auspicious occasion. They had met together to do honour to a man who had won their esteem in the various activities in which he had taken part. He sometimes thought Sir Francis must have chosen as his guide and philosopher Lord Burnham—a man of the widest interests and most diverse activities, who had devoted himself to the furthering of causes which were for the good of the country.

First Prize for the Leamington Priors Gas Company.

The accompanying photograph shows a portion of the display of the Leamington Priors Gas Company for which was awarded the First Prize in Class I. of the floral decoration scheme recently carried out in Leamington under the ægis of the Chamber

of Trade. It was stated by the judges that the Company's display of baskets was as near perfect as possible on the first judging.

Alliance and Dublin Company's Successful Year.

The Ordinary Half-yearly General Meeting of the Alliance and Dublin Consumers' Gas Company was held on Thursday, Sept. 25—Mr. FRANCIS J. DICKENS, J.P. (Chairman), presiding.

The CHAIRMAN addressed the meeting as follows: The sales show a further increase of more than 2½ p.ct. on those of the corresponding half-year. In the June half-year of 1928 our total sales were 1042 million c.ft.; this half-year they have risen to 1157 millions, or an increase of no less than 11 p.ct. During the six months we supplied 3834 gas cookers, 1915 gas fires and radiators, 348 geysers, wash-coppers, and boilers, and a large quantity of smaller gas appliances, including gas irons, which enjoy a well-deserved popularity. A noteworthy feature is the extent to which our prepayment consumers are availing themselves of the attractive terms offered for the installation of gas fires and other classes of gas apparatus, and I am confident that continued progress will be made in this direction. But perhaps the most striking fact is that the number of gas consumers has increased by approximately 4000 during the half-year under review. The greater portion of this increase is in our prepayment department, and the demand shows no signs of abating. The various housing schemes have, of course, contributed to the results to which I have referred.

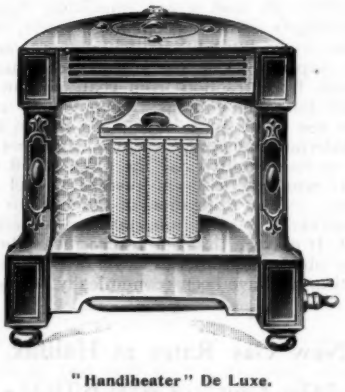
The revenue profit amounts to £71,683. Deducting interest on debenture stock, interest on temporary loans and income-tax and adding the balance—namely, £29,054—brought forward from last account, we have available the sum of £91,833. The dividend now recommended will absorb £59,165 of this amount, leaving the sum of £32,668 to be carried to next account. Thus, after providing for all liabilities, and for the maximum statutory dividend, we are increasing the carry-forward of six months ago by £3613.

Mr. WILLIAM NEWBIGGIN, C.E., seconded the resolution for the adoption of the report and accounts, which was carried unanimously, and on the proposition of the CHAIRMAN, seconded by Mr. J. J. MEAGHER, a dividend at the rate of £7 12s. 6d. p.ct. per annum (less income-tax) was declared on the consolidated ordinary shares of the Company.

A New Gas Heater.

Messrs. Lighting Trades, Ltd., and the Welsbach Light Company, Ltd., are introducing a new portable gas fire under the trade name of "Eltee," to meet the demand for a cheap five and seven tube enamelled gas fire. It will be supplied in grey and brown enamels, and is of attractive appearance. The fire, which we illustrate, is provided with flue outlet of appropriate size, and may be had with a gas regulator if required. The same model can also be supplied in black finish if required.

The "Eltee" Gas Fire.



"Handiheater" De Luxe.

We also illustrate the Welsbach "Handiheater" de luxe, which is solidly constructed with frame of fine grain cast iron, plain polished copper base, and hammered copper reflector. It is supplied with flue outlet, and can be used for boiling water or other domestic purposes.

Works Canteen Opened at Wakefield.

On Saturday last, Mr. G. A. Moorhouse, J.P., the Chairman of the Wakefield Gaslight Company, formally opened a new canteen erected on the Sports Ground by the Company for the use of the employees.

Mr. Moorhouse, in his opening remarks, said that a canteen was a necessity as so many men were unable to get home to their meals. The canteen would easily accommodate 80 people,

THE NEWS—*continued.*

and it had a well-appointed kitchen. A large gas cooker, hot closet, and a "Jackson" boiler formed part of the equipment. Mr. Moorhouse, referring to the increasing use of such gas appliances in all large restaurants and cafés, said it was being realized more and more that for quick and efficient service gas could not be beaten for cooking and water heating. He then referred to the pleasant surroundings in which the canteen is situated, overlooking the bowling green on the Sports Ground which is laid out adjoining the works.

After the opening ceremony, the finals for the bowls and tennis tournaments were played. The President's Cup for bowls was won by Mr. E. C. Matthews, and the Directors' Cup for tennis by Mr. H. C. Hodgson.

The employees and friends numbering about 150 were then entertained at tea in the canteen by the Company, when the capacity of the kitchen was fully tested.

Mrs. Ward (wife of the Engineer and Manager) presented prizes for the bowls and tennis tournaments and also for the best averages in the cricket section.

The proceedings closed with votes of thanks to Mr. Moorhouse and the Directors and to Mr. and Mrs. Ward.

The Harrow Gasholder.

The Harrow Urban District Council on Sept. 29 received a letter from the Gas Light and Coke Company intimating that the Company must proceed with the erection of a 200-ft. gasholder at the South Harrow Works. The Council had protested against the structure on the ground that it would have a detrimental effect on the amenities of the district, and spoil Byron's View from the terrace in front of Harrow Church.

In their letter the Company stated that the gasholder is being erected by the Company under the Government scheme for the relief of unemployment. The foundations of the holder are already laid. The delivery of the material by the contractors for the erection of the holder itself is now proceeding, and the greater part of the material is already manufactured. The Company pointed out that they were taking steps to secure the best possible artistic advice as to colours which would make the gasholder harmonize effectively with the general landscape.

The Council decided to support a town's meeting which is to be called by a local Ratepayers' Association to protest against the proposal, and to write to Major Isidore Salmon, M.P. for Harrow, inviting his assistance.

The Ministry of Health Report.

The following interesting information appears in the recently published Eleventh Annual Report of the Ministry of Health for the 12 months ended March 31 last (Cmd. 3667, September, 1930).

Loans sanctioned to Local Authorities in England and Wales for public works (exclusive of Poor Law and house works and temporary loans) amounted to £35,068,344, of which £6,507,166 was in respect of works undertaken for the provision of employment for unemployed persons, and £1,520,190 was in connection with municipally-owned gas undertakings (as compared with £1,021,526 in 1928-29). No fewer than 533 local authorities, railway and other statutory companies hold certificates of exception from compulsory National Health Insurance—representing some 334,000 employees.

The estimated cost of schemes approved by the Unemployment Grants Committee for the year 1929-30 in respect of gasworks owned by local authorities was as follows:

	£
Works in areas suffering from severe and prolonged unemployment	387,283
Works in other areas, involving the transfer of labour from depressed areas	52,583
	£439,866

This represents 2·3 p.ct. of the total of £19,243,172.

The average amount in the £ of the rates collected in England and Wales in 1929-30 was 11s. 6d.; being an average decrease of 11d. as compared with 1928-29.

NOTES ON NEW BOOKS

PATENTS, DESIGNS, AND TRADE MARKS.*

The Second Edition has been published of the work by H. Fletcher Moulton and J. H. Evans-Jackson on the Patents, Designs, and Trade Marks Acts. This volume contains notes on all recent decisions and changes in law and practice, and a compendium of extracts from decisions given by the Patent Office. As the authors remark in their preface, the never-ceasing flow of cases relating to the subject renders it essential that those who practise in patents, designs, and trade marks should be provided with guides in convenient form to the more recent decisions of the Courts—a need which is accentuated by the circumstance that so great a proportion of the argument and judgments in these causes is concerned with facts relevant only to the particular case, often rendering it difficult to extract those points of law which may be of general importance. The work has already proved to be of great assistance to patent agents both at home and abroad.

* "The Patents, Designs, and Trade Marks Acts," by H. Fletcher Moulton and J. H. Evans-Jackson. Published by Butterworth & Co. (Publishers), Ltd.; price 21s. net.

COAL AND GAS ANALYSIS.*

A section on gas analysis is included in Vol. I. of "Recent Advances in Analytical Chemistry," edited by C. Ainsworth Mitchell. This section is contributed by H. R. Ambler, of the Research Department, Woolwich, who deals in turn with the measurement and manipulation of gas (analysis of very small samples); the chemistry of gas analysis (carbon dioxide, sulphur gases, oxygen, ozone, oxides of nitrogen, carbon monoxide, hydrogen and methane, hydrogen by absorption); fractional combustion methods (carbon monoxide in the presence of hydrogen and paraffins; hydrogen and carbon monoxide in the presence of methane; nitrogen; water vapour); automatic gas analysis; condensation methods; fractionation of hydrocarbons; condensation method for very small quantities; density method; thermal conductivity; refractivity; spectroscopy; and electrical methods. Considering the progress of gas analysis in the past ten years, the author states that the most marked feature of the developments is the number of specialized physical and semi-physical techniques which had been brought out. With regard to the more regular methods, the most important chemical advances are in the various fractional combustion methods which, although not new in principle, have only recently come into widespread use. The problem of the precise determination of hydrogen, carbon monoxide, and methane, he observes, is solved by these methods, although there is still scope for simplifing the procedure and apparatus necessary. With regard to higher hydrocarbons, on the other hand, it seems that the chemical method is unlikely to provide a solution to the problem, which is, however, being found along purely physical lines. The author believes there is much scope for the perfection of many of the commonest analytical processes; a thoroughly satisfactory absorbent for oxygen has yet to be discovered, and an absorbent for methane would be of great utility.

J. G. King and R. A. Acton-Taylor, of the Fuel Research Station, East Greenwich, deal with the analysis of coal, devoting attention to proximate analysis, calorific value, agglutinating value, carbonization assay methods, ash, coal constituents, rational analysis, and pulverized fuel.

Other sections of the book are on sugar (C. L. Hinton), oils and fats (C. A. Mitchell), essential oils (E. J. Parry), the proteins (D. J. Lloyd), tannins (C. A. Mitchell), cereals (D. W. Kent-Jones), milk and milk products (G. D. Elsdon), paper (W. Dickson), and petroleum and its hydrocarbons (J. G. King and R. A. Acton-Taylor).

* "Recent Advances in Analytical Chemistry," Vol. I., edited by C. A. Mitchell. Published by J. & A. Churchill; price 12s. 6d. net.

Other Publications Received: "Catalogue of British Scientific and Technical Books" covering every branch of science and technology, carefully classified and indexed, New Edition, entirely revised and enlarged. Published by the British Science Guild, 6, John Street, Adelphi, W.C. 2. "The Economic Value of Coal Cleaning in relation to the problem of dust and sulphur emission from chimneys"—a reprint of Dr. R. Lessing's paper at the Second World Power Conference, Berlin, June, 1930.

UNIFORM CALORIFIC - - - VALUE? - - -

In which "B.Th.U." maintains that the best interests of the gas industry lie in a slackening, not a tightening, of legislative shackles. We cannot have a "National" Standard except by compulsion of Statute.

In the "GAS JOURNAL" for May 20, 1925, the present writer contributed an article "Observations on Calorific Value and Gas Testing," being led thereto by the frequent pleas then being made for gas of constant calorific value, composition, and pressure, including one suggestion from an important source that the time appeared to have arrived for considering a uniform national calorific value. The main purpose of the article was to attempt demonstration that before a national standard could be entertained it would be needful for individual undertakings first more generally to conform closer to calorific value within their present declarations. It was not contended that this was called for by any disadvantages experienced at the consumer's end by a margin of 6 p.ct. being allowed under official testing before penalties could be invoked for defective quality. Indeed, in a later article (July 15, 1925) it was held that the 6 p.ct. margin must have worked out satisfactorily in practice, or someone would by that time have produced evidence to the contrary. But, if an undertaking supplying (say) gas at a declaration of 450 B.Th.U. were called upon to supply, at the advent of a national standard, (say) 500 B.Th.U., it is not easy to see how the cause of uniformity would be promoted if, at the lower standard, that undertaking had supplied gas at a range extending from 423 to (say) 477 B.Th.U.

Are the conditions varied from what they were five years ago in the matter of affording evidence that a national standard is now more desirable than it was then? This question is asked because, though the cry for uniform quality on a national basis has been less obtrusive in the last five years than it was in the five years 1920-1925, Mr. P. M. Sim in his "Random Thoughts" to the recent North British meeting asked: "How often . . . has the thought occurred to members that obstacles in the way of the adoption of a uniform calorific value of gas throughout the country must be fast disappearing?" Mr. Sim gave as his ground for believing the omens for a "national" standard were better that during the ten years' operation of the 1920 Act plant and appliance manufacturers and research have been busy removing the obstacles to a "national" standard, that antiquated appliances and inadequate mains have disappeared, and that therefore most, if not all, undertakings, were qualified to produce a "national" standard gas within their respective areas.

The logic of Mr. Sim's reasoning is not too apparent. What plant manufacturers have done is to evolve refinement of operation which induces more regular quality of gas in different classes of carbonizing plant, and possibly a slightly higher yield of gas per ton of coal, or per gallon of oil used. In this they have been ably seconded by the enterprise of those who have permanently to work the plants. The refining operation has extended to auxiliary plant, as witness the advent of dehydration. Research has told us a little more about the behaviour of coal in retorts, and its effect on residuals during the process of carbonization; under this head comes the blending of coals, and the expectations held as to the ultimate benefit likely to be obtained by its extension. If antiquated appliances have disappeared (the writer begs leave to doubt this), it has merely yielded more economical performance in operation irrespective of gas quality *per se*, and has not, as far as one can see, done anything particularly helpful in the way of consummating "national" gas. If inadequate mains have disappeared, the process of elimination has afforded consumers more dependable pressure, but that is as much a desideratum in gas of 400 as it is of 560 B.Th.U. gas. What Mr. Sim cites as evidence in favour of "national" gas is equally as forceful in its testimony in favour of gas of any quality.

There are still the same varieties or types of plant. The improved performance from each has not drawn visibly nearer the capacity of all to produce gas of common quality. In his William Young Memorial lecture, Sir Arthur Duckham said the best all-round results in continuous verticals working with normal Yorkshire coal are obtained when working to a standard of "about" 475, in intermittent chambers when working to a standard of 500, below which "there is a rapid loss in the thermal and commercial efficiency." Here, Sir Arthur compared plants which afford an opportunity (from his own experiences) of close comparison, and did not venture into the realm of horizontals, or, at the other end, of complete gasification, varieties of which processes are still relied upon by gas undertakings for meeting their needs.

The South Metropolitan Gas Company still works to a declaration of 560 B.Th.U., and shows no inclination of doing otherwise, or of divorcing itself from straight carbonization. When a single undertaking selling nearly 9 p.ct. of the gas sold by statutory companies in England and Wales stands firmly to a 560 standard, it is surely premature to talk of a "national" standard, or to assume that conditions are more favourable to it than they were five years ago. Even those who think a "national" standard should be imposed never do so in terms of 560 B.Th.U. gas, but, more likely, of 500 B.Th.U.

Nothing has transpired in the last five years to alter the fundamental fact that it is local facilities as to supply of coal, &c., which still, as in 1920, determine what quality of gas an undertaking can most economically supply. The state of demand for coke is also a subsidiary factor. (It has time and again been pointed out, and demonstrated by statistical verification, how much the price of coke affects gasmaking economics.) Has there been any development which, in these regards, has placed the attainment of a "national" gas visibly nearer? If there has, it has successfully eluded the gaze of the present writer.

DECLARATIONS IN VOGUE.

Up to Dec. 31, 1929, in England, Wales, and Scotland some 689 declarations of calorific value had been made. Up to the same date there had been 139 revisions of original declaration, or no less than 20 p.ct. on the total declarations prevailing as at Dec. 31 last. Revised declarations have been both in the upward and the downward direction, indicating that there is no definite trend either one way or the other. Some undertakings have two, three, or even four revisions already to their credit. In a number of cases revision has been made consequent upon the absorption of neighbouring undertakings, and the subsequent uniform quality distribution which has resulted from joining up the mains of the amalgamated undertakings. But, in the main, revised declarations seem to have ensued on a realization that the new figure would more suitably fit the local conditions as to available coal, &c., and the plant by which the materials are transposed into gas for public supply.

A momentary pause may be taken here to reflect what would have happened if, instead of the initiative as to quality being with individual undertakings, there had been a national standard in operation. The undertakings which felt a revised declaration advisable would have been in no better, but certainly a worse plight as to achieving their desires. They would have been bound "hand and foot" to the national prescription, thraldom to which would take precedence over the consideration of gasmaking economics.

The declarations in vogue at the end of 1929 range from 200 to 600 B.Th.U., but when a few comparatively small undertakings are eliminated, the range is of much smaller compass. Below 400 B.Th.U. there are only four undertakings—viz., declarations in brackets: Nuneaton (200), Goring (320), Port Glasgow (375), and Newton-in-Makerfield (390). At the other end of the scale there are three undertakings with a declaration above 560, each of which has selected 600—viz., Croston, Lampeter, and Evesham. Those below 400 only sold 397 million c.ft., and those above 560, 89 million c.ft. of gas in 1929, a total of 486 millions, or 0·17 p.ct. on the total sales by statutory undertakings. For all practical purposes, then, the range of quality now prevailing may be taken as from 400 to 560 B.Th.U. —*i.e.*, the equivalent to 100 to 140.

Analysis of the declarations at various calorific values, and calculations made by multiplying each by the number of undertakings adopting it, reveal the singular fact that the average works out at exactly 470 B.Th.U., or the mean between the range of 400 and 560—*i.e.*, leaving out the seven small undertakings with a wider range which are detailed above. Superficially, it would seem as if a factor of 4·7 would, when applied to the total gas sold (1000's c.ft.) in the kingdom, give the aggregate therms supplied, even though that figure is not yet available through the annual Board of Trade return. But the 4·7 is derived by assuming each undertaking as being equal to the remainder, whereas the output of the undertakings with high declarations is relatively greater than that of those with low declarations.

There are no fewer than 229 undertakings which have a declaration of 500, and which jointly sold, in 1929, 113,500 million c.ft. of gas, and 21 others with higher declarations which sold in the same year 19,822 millions, and the declaration of which averages 554 B.Th.U., through the South Metropolitan Gas Company with its 560 declaration, and its annual sale of 16,493 million c.ft., bringing up the average of the other 23 much smaller concerns. Jointly, undertakings with a declaration of 500 or over number 250, and have an average of 508

B.Th.U. on an aggregate sale of 133,422 millions—*i.e.*, 46·1 p.ct. of the total sold by statutory undertakings in Great Britain in 1929. As all statutory undertakings had not published a declaration at Dec. 31, 1929 (about 80 having still to declare), it may be taken that undertakings with 500 or over declaration (average 508) represent approximately half the gas sold by statutory undertakings.

There are 432 undertakings with declaration from 400 to 490 inclusive. Of these, 19 are at 400, 64 between that and 450, 157 at 450, 67 between that and 475, 77 at 475, 44 at 480, and 4 at 490. The average of these declarations is 452 B.Th.U., and assuming (which appears the case from tentative calculations) that the sale of gas by the 432 undertakings is equal to that of the 250 with an average of 508, it follows that the average quality of gas now supplied (452 + 508 ÷ 2) is 480 B.Th.U. It would be a laborious exercise to work it out precisely, but it is certain that the final figure would be close up to 480. Thus, to convert the total gas sold as per Board of Trade return from c.ft. to therms, a safe basis is to take the number of 1000's of c.ft. and multiply them by 4·8. For 1929 this would be: 289,236,000 × 4·8 = 1,388,332,800. (NOTE: South Staffordshire Mond Gas Company excluded.)

BACK TO THE "NATIONAL" STANDARD QUESTION.

The preceding survey of declarations in vogue is given not only because of its general interest, but also because it has a close bearing upon the praticability or otherwise of inaugurating a "National" standard. With present declarations at 25 different denominations the case for a uniform standard is not a strong one. If that standard were fixed at 500, as it would certainly have to be to win acceptance in the Metropolis (where the South Met. would probably be a dissentient), there would be two-thirds of the gas undertakings in the kingdom which would have to modify their existing declarations.

It is submitted that such developments as have proceeded since the Gas Regulation Act came into force have weakened, rather than helped, the case for a "National" standard. It is beyond question that, by improving pressure, gas appliances, and gas manufacturing plant, the supply to the public has been bettered under existing conditions of individual declarations. Mr. Sim says that, to compete with either oil or electricity, the industry should "at least have a standard in quality equivalent to those against which it is competing." Surely the industry has that standard in the THERM. There can be no such thing as differing and confusing comparisons between different areas now that the therm has been applied generally. Save for undertakings below 20 million annual sale and others which are non-statutory, the therm system of charging became compulsory from April 1 last.

It would be a grave and retrogressive step for the industry to barter away its present freedom to supply what quality it thinks fit for a hypothetical and unproved advantage in competition. Even if we had a "National" standard of quality, there would still be variations in composition and specific gravity, not to mention the variations in pressure which, while maintained at over 2 in. pressure in conformity with Act, still widely varies above that figure, and even varies considerably in individual districts.

MAKING THE BEST OF PRESENT CONDITIONS.

A more desirable need is for undertakings to keep the quality, specific gravity, and pressure as uniform as conditions will allow under existing declarations. In the article (May 20, 1925) the writer gave an example from one undertaking which showed, at a declaration of 500, variations ranging on the official tests from 471 to 529. Some improvement has been effected in that instance, for the variation in the last quarter was 34 against the 58 of five years ago. Whether it is a pressing need that quality should be uniform, it is not proposed to discuss here. It is self-evident that, if a uniform quality in particular areas is desired, it does not need the lash of a "National" standard to promote that end. Rather do the best interests of the industry lie in a slackening, and not a tightening, of legislative shackles. We cannot have a "National" Standard except by compulsion of Statute.

Since writing the foregoing the present contributor has carefully read Mr. J. Mogford's interesting paper to the Wales and Monmouthshire Institution, in which he also pleads, though not enthusiastically, for a uniform standard. Nothing in that paper induces the present writer to "wilt" from the conclusion drawn above that a uniform national standard is undesirable. To what has been said one observation may be added, viz.: Once a "National" standard was fixed, it might easily be a prelude to the narrowing of the present margin of 5 p.ct. allowed before a second test is called for from the official gas examiner, or 6 p.ct. before penalties can be invoked.

IN CONTINENTAL COUNTRIES - - -

Abstract Translations from the Technical Press of France and Germany.

IGNITION VELOCITY OF GASEOUS MIXTURES.

A comprehensive investigation of ignition velocity has been made by Bunte and Litterscheidt ("Das Gas- und Wasserfach," 1930, **38**, 837-842, 871-878, 890-896 (Sept. 6, 13, 20)).

For the development of high flame temperatures and the maximum efficiency of gas fires, the question of the ignition velocity of gaseous mixtures is of great importance. For the first time, a systematic investigation of the ignition velocity of gaseous mixtures has been made. The dynamic flow method of Gouy and Michelson was employed. The values obtained for the ignition velocities of mixtures of gases and air at constant pressure apply equally well whether the mixture is at rest or is flowing at a velocity lower than the critical velocity.

The investigation covered mixtures containing one, two, and all three of the gases hydrogen, carbon monoxide, and methane in widely varying concentrations. It was found that there is no simple proportionality between the concentration of the gases and the ignition velocity. Methane has a relatively large effect on the ignition velocity of mixtures.

The influence of inerts (nitrogen and carbon dioxide) on the ignition velocity of both pure combustible gases and of mixtures was also studied. Due to the higher specific heat of carbon dioxide, this gas has a larger effect in retarding the velocity than has nitrogen.

As a result of the investigation, the relationship between the maximum ignition velocity of all mixtures of methane, hydrogen, and carbon monoxide, and the percentage of combustible gas present is shown graphically for combustion in air, the maximum values ranging between 1·2 and 8·8 ft. per second. With the aid of two supplementary graphs, corrections may be made for the amount of carbon dioxide and nitrogen present. Thus all gaseous fuels are covered save that no consideration has been given to the question of heavy hydrocarbons. Nevertheless, the values obtained by use of the graphs agree well with values which have been recorded for gaseous fuels. The results obtained by the dynamic flow method are compared with those obtained by static methods.

Nusselt's method of calculating combustion characteristics is critically examined with a view to attempting to render it possible to arrive at a closer comprehension of the theoretical considerations underlying the propagation of ignition in mixtures of combustible gases and air.

AGGLUTINATING POWER OF COALS.

Three blends of two coals (a coking coal with 25 p.ct. V.M. and an anthracite) in varying proportions were tested according to the methods of Meurice-Kattwinkel, Meurice-Gabinsky, and Marshall-Bird by Agde and Winter ("Brennstoff-Chemie," 1930, **11**, 394, Oct. 1).

In each case, the relationship between agglutinating value and the percentage of coking coal in the blend was a linear one, and the lines obtained by the three methods were approximately parallel. This would indicate that values obtained by one method might be translated to one of the other methods by use of an appropriate factor. Investigation of another coal, tested without blending, showed, however, that this is not the case, and the relationship between the values obtained by the three methods is different for each coal.

The results obtained by the first two methods are not nearly as reproducible as are those obtainable by the Marshall-Bird method, since in these methods segregation of the sand and coal may occur, whereas this is prevented in the Marshall-Bird method by the use of glycerin to moisten the sand and by the subsequent compression of the mixture of coal and sand. This method is, therefore, to be preferred.

Attractive Gas Showrooms - - at Leatherhead - -

Great enterprise has been shown by the Leatherhead Gas Company in the erection, early this year, of attractive and up-to-date showrooms, offices, and stores in a prominent position in the centre of the town.

An excellent example of modern gas showroom practice is to be found in some fine premises, erected early this year by the Leatherhead Gas Company, in a prominent position in the centre of the rapidly growing Surrey town of Leatherhead.

The future possibilities of the district were fully realized by the Directors of the Company when they decided to erect the premises shown in the accompanying photographs. The Leatherhead Gas Company is as yet only a comparatively small undertaking, but, under the energetic management of Mr. D. F. Irving, A.M.Inst.C.E., the annual make of gas has shown a steady increase during the past five years from 140 million c.ft. to 194 millions, while the number of consumers has now reached 4780. This rapid growth has necessitated the recent addition at the works of an installation of Woodall-Duckham continuous vertical retorts of a daily capacity of 600,000 c.ft., at a cost of £14,000. The area of the Company is some 40 square miles, and includes the districts of Leatherhead, Cobham, and Byfleet, the latter being an isolated area to the north-west of the main district.

EXTERIOR VIEW OF THE NEW LEATHERHEAD SHOWROOMS.

Description of the Premises.

The showrooms are ideally situated for attracting the attention of passers-by, occupying a corner site, the exterior being in Georgian style of mottled red brick, and the windows so arranged that the whole of the interior of the main showroom can be seen from the outside. There is a lawn in front which is an excellent advertisement for the sulphate of ammonia to be obtained within; and there is also a private parking space available for motor cars.

A point which struck us very forcibly when we were enabled to inspect these showrooms recently, under the guidance of Mr. Irving, was the absence of that appearance of overcrowding which is too often in evidence in present-day showrooms. One was able to look round and take stock of the appliances without being bewildered by a great mass of apparatus. Immediately on entering by the main doorway, the visitor is faced by the inquiry desk, where advice can be obtained upon any matters relating to consumers' appliances, where complaints (if any) can be lodged, and where accounts can be settled. On each side of this desk are the two main sections of the showroom. The left side is sub-divided to represent three rooms in an ordinary house—drawing-room, dining-room, and library. In suitable surrounds gas and coke fires of various designs applicable to the rooms in question, together with a gas-heated radiator and artistic lighting fittings, are displayed. Jacobean standard lamps are placed near the windows, and every effort is made to make the visitor feel at home by the provision of comfortable chairs and tables at which a selection of advertising literature is prominently displayed.

The other half of the showroom is devoted to an exhibition of the most modern gas cooking and water-heating appliances. One section has been arranged as a complete bathroom, with geyser and gas-heated towel rail and an attractive gas fire which has been fitted into the scheme of decoration. This installation has attracted considerable attention. There is also in this section a representation of a bedroom with a suitable gas fire in the shape of an inclined Cannon apparatus in an attractive green tiled surround. At the far end of the room is a model kitchen, fitted with an up-to-date cooker, a coke boiler, a wash-boiler in mottled enamel, and an "Electrolux" gas-operated refrigerator, shown in action. Gas irons, pokers, &c., are also displayed. At regular intervals this section of the showroom is transformed into a cookery demonstration room by the addition of a platform at the far end, and seating accommodation is thus provided for some 50 or 60 people. These cookery demonstrations are always well attended.

The lighting of the main showroom is by Sugg's ventilating distance-controlled lamps, while the heating is done by means of the various gas fires which are connected up for demonstration purposes.

The Stores.

On the first floor are situated the Board Room and Offices, all of which are of ample proportions, bright and airy. These rooms each have a gas fire, and supplementary heating is afforded by a central heating installation operated by a coke-fired boiler.

At the rear are the stores and workshops, the former being fully equipped with steel bins and shelves, while for the rapid handling of goods a motor lorry dock is provided and fitted with a light travelling crane. The heating of the stores and workshops is carried out by the Fretwell overhead system. This system is extremely effective, the heating pipes being carried across the roof, and on a cold day the comfortable warmth of the building is very noticeable, while the pipes are well out of the way. The system is operated by a coke-fired boiler.

A SECTION OF THE INTERIOR OF THE LEATHERHEAD SHOWROOMS,

Showing, on the right, appliances in suitable surrounds for drawing-room, dining-room, and library settings.

Some Recent Results.

The sales effected through the new showrooms during the first half-year to June 30 last since their opening have been very satisfactory, as the following figures indicate:

—	Cookers.	Fires.	Geysers and Coppers.
Leatherhead . . .	59	38	10
Cobham	29	42	8
	88	80	18

Results up to the present point to even better sales during the current half-year.

The Architects were Messrs. Hodgson, Dixon, & Quick, of Guildford, and the present design was decided upon after an inspection of the latest types of showrooms of a number of leading gas undertakings. The premises supersede a smaller building in Leatherhead, and it has thus been possible to centralize the showrooms, offices, and stores in the same building, which was not the case before, the latter being housed under somewhat unfavourable conditions at the works. The putting through of orders has, therefore, been greatly facilitated, and the Company is to be congratulated on its enterprise.

A short while ago a party of 44 members of the East Greenwich Staff Club of the South Metropolitan Gas Company paid a visit of inspection to the Leatherhead works and to the new showrooms and were much impressed by the progressive policy of the Company. They were accompanied by the Assistant Engineer at Greenwich (Mr. T. H. Canning), Mr. Andrews being unavoidably detained at the last moment. Afterwards the party were welcomed by the Chairman, Dr. Laurence Potts, M.R.C.S., and entertained to tea.

GLOVER-WEST VERTICALS - - IN BRITTANY - -

The Glover-West vertical retort house at Vannes, a town of 23,500 inhabitants, is of novel design.

The contract for this work was placed with the Cie. Gle. de Construction de Fours of Montrouge (Seine) in September, 1928, the construction of the plant being completed in January, 1929. The following description is taken from the "Journal de Usines à Gas," March 5, 1930.

General Arrangement.

At the side of the buildings of the old works, a large area was available, of which a part only was occupied by the coke yard and screening plant and of which one side was bounded by a shed serving as a reserve coal store. The new bench was therefore placed alongside the coke yard.

This new bench comprises three settings each of two retorts of the Glover-West standard type. Two of these settings only are sufficient for the existing demand of about 4000 cub.m. The other setting serves as reserve in case of increase of demand and during repairs. The total capacity of the bench when the three settings are under fire would be 7200 cub.m.; but a further extension can be readily carried out without interfering with manufacture.

Description of the Installation.

In order to reduce the first cost the building was simplified in every way compatible with the convenient operation of the retorts. It is of the so-called "umbrella" type, and comprises essentially two sections, one resting direct on the retort bench bracing, the other protecting the waste-heat boiler, extractor driving gear and the several staircases and platforms.

The coal bunkers are supported upon the steel retort bench bracing. The coke hopper is also fixed to the bracings of the retort bench and the producers.

The platforms and all passages are sufficiently protected from rain by the roofing, and the top of the retort bench, which is mostly used by the personnel, is protected by vertical sheeting against the often violent winds of this maritime region.

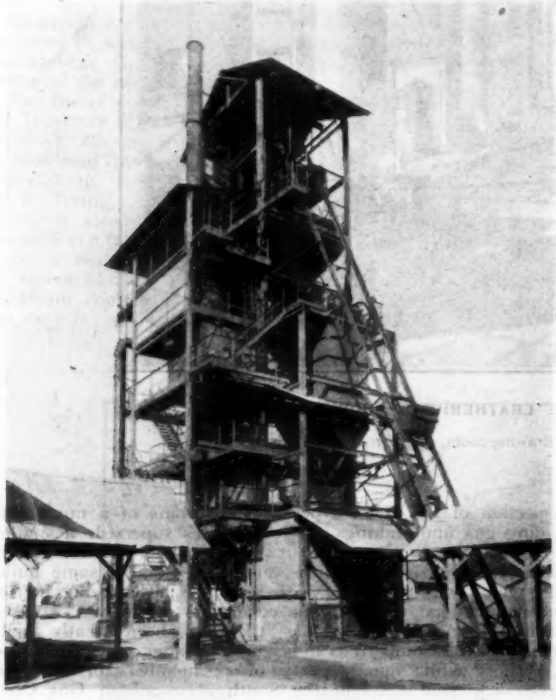
Coal and Coke Handling.

The handling of the coal as well as that of the coke is effected by a single piece of apparatus, an inclined skip hoist which can be discharged either into the coal bunkers or into the coke hopper. The movable cam is arranged at the point of coke delivery. When in a suitable position it causes the coke to be tipped. When it is moved away the skip rises to the principal part of the building and is discharged above the coal bunkers. In both cases the action of the apparatus

is completely automatic; the pressure of a button suffices to effect the elevation, the discharge and the return of the skip.

The coal is brought to the retort bench in small wagons on a railway of 0·60 gauge running along the pit and falls direct into the skip, in which it is raised and discharged into a pivoted shoot, the outlet of which can be directed above one or other of the six compartments corresponding to each retort.

The charging of the retorts is effected by means of an intermediate hopper fed at regular intervals by a rotary valve



View on the Producer Side of the Plant, showing the Inclined Skip Hoist.

situated immediately below the mouthpiece in the base of the bunker. The capacity of this intermediate hopper corresponds to about two hours' working. The coal which it contains rests upon the charge in the retort and descends with it, regularly and uniformly with the continuous removal of the coke.

The coke, which is introduced into the retorts after scurfing, follows the same route as the coal. The coke for heating is charged into the skip hoist in the same manner as the coal, and is discharged into the producer hopper. Below this hopper it is discharged into a travelling skip from which one or other of the three producers can be fed.

Settings.

Each setting contains two retorts, through which the coal, charged at the top, descends vertically and is progressively converted into incandescent coke. In the lower sections of the retort this coke is submitted to the action of steam raised in the waste-heat recovery boiler. This steam is introduced at the base of the retort by way of pipes fitted with a pressure rotation valve and the necessary regulating valves.

The steam, acting upon the red-hot coke, gives rise to an endothermic reaction which assists in quenching the coke and generates a quantity of water-gas, which varies with the proportion of steam injected. This water-gas rises within the retort, where it meets the gas distilled from the coal. Very complex reactions take place then, between the steam not yet decomposed, the water-gas, and the hydrocarbons of the coal, which result in a particularly higher yield of gas and of tar.

The retorts are built in substantially formed silica bricks, tongued and grooved and carefully adjusted to ensure the tightness of the retort walls. The retorts are placed in a brickwork bench strongly braced to avoid all excessive deformation and supported by a flooring composed of rolled-steel joists resting upon steel stanchions. Each setting possesses a step grate producer cooled by running water. The producer gas is consumed in contact with the walls of the retorts in horizontal superimposed flues constituted by tiles forming partitions which tie the retorts solidly to the vertical walls

The waste gases coming from the settings, at the upper portion, are collected in a main flue which leads them to the point of heat recovery and to the chimney. The brickwork of the retorts is supported by castings fixed to the girder floor as above described. To the lower portion of these castings cast-iron hoppers are attached containing the mechanism of extraction. The principal organ of this mechanism is a helix with vertical axis which, actuating with a slow movement of rotation, disintegrates the mass of coke, the pieces of which fall into the receiving hopper. The helix is driven by a ratchet arrangement which receives an alternating movement from a steel cable driven by an electric motor with reduction gear.

The storage hopper which receives the coke is provided with a bottom lid with eccentric fastenings opened every two hours to discharge the cooled coke into wagons circulating at the ground level below the settings.

Extraction of Gas and Tar.

The gas coming from the retorts is led into a collecting main through cast-iron pipes with lids conveniently placed for easy cleaning. The gas, tar, and ammoniacal liquors from the collecting mains are evacuated by a foul main, at the end of which is placed a syphon in which separation is effected. The gas is directed towards the exhauster and condensing apparatus; the tar and liquors are conveyed to the wells.

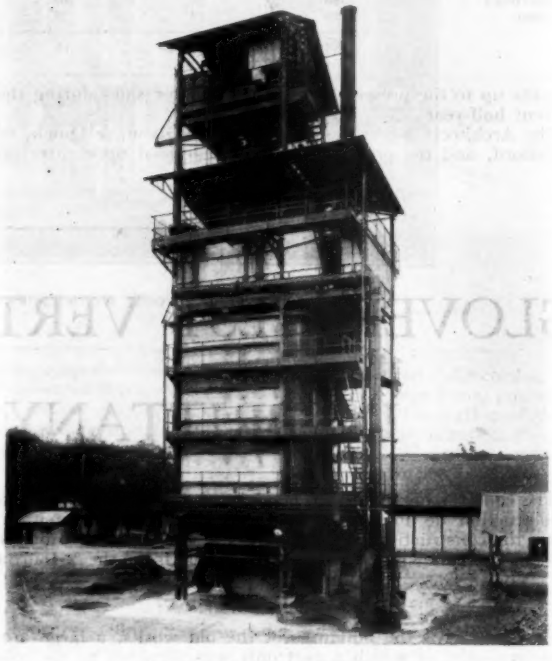
A portion of the liquor, after separation, is returned by a pump to a tank placed in the upper level of the building, from which it is led again to the collecting mains, where it is enriched.

Boiler.

The waste gases coming from the settings are passed through a "Field" type boiler which produces the steam necessary to the steaming of five retorts. At the exit of the boiler the steam passes through a superheater which raises its temperature to 350° C. The boiler is fed with water by a steam pump controlled by an automatic feed regulator. It is possible in case of need to by-pass the boiler and take the waste gases direct to the chimney.

Screening.

The wagons containing the coke drawn from the retorts are led to the screening plant and discharged into the coke breaker. The broken coke is elevated and discharged into a rotary



Another View of the Installation.

screen which sorts it into five categories. The classified coke falls into hoppers under which run the vehicles for delivery to the consumer.

The two first settings were brought into operation in September, 1929; the results have been entirely satisfactory, all the guarantees of heating and production being considerably exceeded. It is to be noted, in particular, that the operation of the retort bench has been effected since starting-up by only one man per shift.

L. Gendre,
Manager of the Gas-Works of Vannes.

THE "JOURNAL" TECHNICAL RECORD

Which also contains Full Reports of Meetings of Gas and Allied Associations

North of England Gas Managers' Association

Meeting in Darlington

The Autumn Meeting of the North of England Gas Managers' Association was held at the Technical College, Darlington, on Friday, Oct. 3, when the President, Mr. A. E. Ruffhead, Assoc.M.Inst.C.E., M.Inst.Gas E., Manager of the Darlington Corporation Gas Department, presided. The meeting was particularly well attended, and the Hall of the College was well filled when Mr. Ruffhead opened the proceedings.

The MAYOR OF DARLINGTON (Councillor H. P. Bell) offered a civic welcome to the visitors.

The minutes of the previous meeting were taken as read, and the election of one new member, Mr. E. R. Frith, of the Amble Gas-Works, Northumberland, was confirmed by the meeting. Mr. Ruffhead then called upon Councillor Bell.

It was a very unusual thing, the Mayor said, for a member of the Corporation to have as his Chairman an official of a Municipal Undertaking; but because of this, it gave him even greater pleasure to offer Mr. Ruffhead, as Manager of the Darlington Gas-Works and as President of the Association, and the members of the Association, a hearty welcome to Darlington. He wished to add that the Gas, Electricity, and Water Committee of the Corporation had learned with pleasure that their Manager had this year been elected President of so influential a body. They recognized and appreciated the high honour that had been paid him. The manufacture of coal gas for purposes of illumination was one of the most striking instances of science enlisted in the cause of civilization. Once a luxury or convenience, it was now almost a necessity. Far away back in 1726, Stephen Hales succeeded in making combustible gas. Towards the end of the Eighteenth Century, there had been further developments, and William Murdoch had been able to light his house with gas which he himself had manufactured. In its early days, coal gas had had a struggle for existence, because of the lack of purification. Councillor Bell traced the early history of public lighting and the development of the gas industry in his town. Darlington had progressed with its industries, he continued, and had grown considerably since 1817—when gas was first being introduced in the main cities of Europe, and when the population of the town stood at about 5500. He felt that he could be proud of his town when he recalled that gas for illuminating purposes was employed but a few years after it had been introduced in London and Paris. The streets of London were lighted by gas in 1812, and Paris followed three years later in 1815. It was only two or three years later that gas was used in Darlington. About 1817 or 1818, the shop of Mr. Edward Todhunter, a plumber and engineer who was foremost in his trade, in Tubwell Row, Darlington, was lighted by gas of his own manufacture. Crowds gathered around his shop each night, when darkness had fallen, to gaze in amazement at the novel, brilliant flame in the window. In those days, the principal shops were but dimly lighted, either by candles or by lamps. In the smaller shops, darkness was dispelled by the tiny flame of a solitary, thin, tallow dip. The ill-paved streets of the town were dangerously dark after sunset and afforded an excellent natural shelter for the misdeeds of a band of miscreants who infested the dark, narrow lanes and streets and molested merchants and townspeople who returned home after dark. It was not difficult to see how important the development of gas in those days had been when it afforded so ready a means of public lighting.

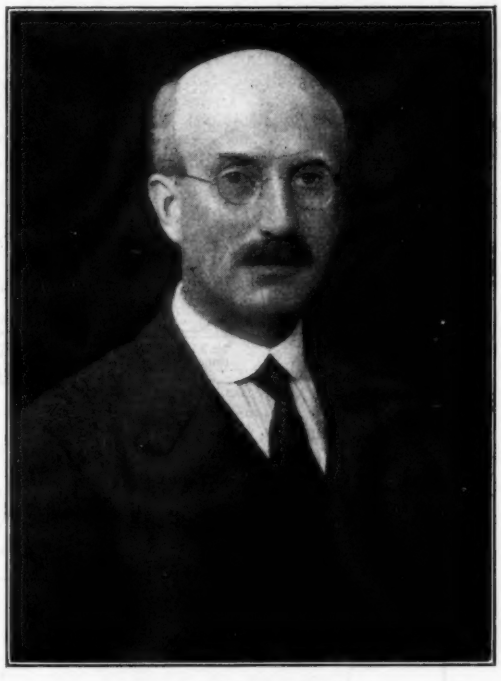
Public lighting in Darlington was unknown until, in March, 1823, an Act of Parliament was obtained for lighting, watching, and cleansing the town, under the direction of a Board of Commissioners, and the streets were henceforward lighted with oil lamps. Various improvements in the social and physical conditions of the town followed, however, and the results of these led to the formation in 1830 of a Gas Company by which public lighting was supplied at a rate of charges stipulated by the Board of Commissioners.

That gas undertaking gave service until 1846, and then in that year a new Shareholding Association was formed which subsidized the old concern. The Association purchased the old works and carried on. The second property was subsequently incorporated under Act of Parliament, and was by arrangement taken over by the Darlington Board of Health in 1854, under the title of the Darlington Gas and Water Company; and the Undertaking had been in full operation since. Those who in those early years had looked into Todhunter's shop window at the first use of gas as an illuminant in the town could not have realized the magnitude of the developments that were later to take place.

They were well satisfied with their Gas Undertaking in Darlington. During the past twenty years there had been but one year when the returns of the undertaking had not shown an increase.

The PRESIDENT, thanking the Mayor for his welcome, said that it was his duty to express the sincere thanks of those present to the Mayor and members of the Darlington Council who had welcomed them to the town. In Darlington they had a Council who always endeavoured to assist officials of the Gas Undertaking in every possible way.

Mr. C. F. BLINCOE, Manager of the Middlesbrough Gas-Works, expressed the thanks of the members of the Association



THE PRESIDENT,

A. E. RUFFHEAD, Assoc.M.Inst.C.E., M.Inst.Gas E., A.K.C.

Mr. Ruffhead was educated at King's College, London, and was elected Associate of the College on completion of the course in Civil Engineering. He then entered the Drawing Office of Messrs. T. & C. Hawksley, C.E., London, Gas and Water Consulting Engineers, and was employed by them for eight years, during which time he was engaged as Resident Engineer in building three pumping stations for the Sunderland and South Shields Water Company, and as Engineer to the Barnstaple Water Company. During the years 1907-9 he was employed as Resident Engineer, under Mr. Chas. Dru Drury, in building the complete Ayres Quay Gas-Works with Dessau vertical retorts, for the Sunderland Gas Company. In 1910-11, he superintended the erection of a horizontal retort house and other works for the Burton-upon-Trent Corporation Gas Department. Mr. Ruffhead went to Darlington in June, 1911, as Assistant Engineer under Mr. Frank P. Tarratt, and was responsible for the design and construction of a Glover-West continuous vertical retort house, coal store, coal and coke handling plants, purifiers, &c. He was appointed Engineer and Manager to the Darlington Corporation Gas Department ten years ago.

for the kindness of the Darlington Education Committee for the use of the spacious hall of the Technical College, and to the Parks Committee for the floral decorations which adorned it. They all envied the position of the Darlington Undertaking, with its low capital and its modern works and the low price of its gas.

Mr. C. Dru Drury, of Sunderland, seconded the proposal.

Sir Charles Starmer, Chairman of the Darlington Gas, Electricity, and Water Committee, also welcomed the visitors. He mentioned that his experience of the Corporation Undertaking dated back 27 years, and during that time the management of the Gas Undertaking had always been carried out by a body of men who had invariably given careful thought to the subject. The Undertaking of the Corporation was one of the pioneers in municipal utility concerns. When their former Manager, Mr. Frank P. Tarratt, had decided to relinquish his position at Darlington to take another post, he had suggested that the then Gas-Works Assistant Engineer, Mr. Ruffhead, their President that day, should be made Gas Manager. They had taken Mr. Tarratt's advice, and Mr. Ruffhead was appointed in 1920. It was not an easy matter to run municipal undertakings; it was not so easy as running private enterprises. With municipal undertakings, there were so many people to please. Some members of the Council at times brought up

difficulties, and, because of this, schemes were sometimes slowed-down. In Darlington, they had not much reason for complaint. They had the cheapest electricity in the whole country, and their gas was as cheap as practically anywhere. Admittedly, they had spent a lot of money upon their water—about £100,000—but then they had not increased their water rate since before the war. Altogether, they could claim that they were a good example of municipal trading. He thought that it was a good principle that one committee only should handle the affairs of the municipal utility services of a town, because it did away with a great deal of needless expense and overlapping. They laid gas where they wanted to, and they laid electricity where they wanted to, and water where they wanted to; and because of this there was no unnecessary waste, and they were able to get on with the job.

PRESIDENTIAL ADDRESS

Of A. E. Ruffhead, A.M.Inst.C.E.

During the past half-century, many men of outstanding ability have occupied the position in which I find myself to-day, and I am deeply conscious of the honour you have done me in enabling me to address you as President of our Association, and giving me the opportunity, on behalf of my Committee and Council, of welcoming you to Darlington.

It is 27 years since Darlington was last favoured with your presence, when my predecessor, Mr. Frank P. Tarratt, delivered his Presidential Address, and my friend, Mr. A. Clement Hovey, gave a most interesting and useful paper on the Tynemouth Gas-Works extensions, with many details of capital and working costs of the plant, and copiously illustrated with drawings, photographs, and lantern slides—such a paper as would be most welcome at our next meeting if some member will kindly take the hint, and I would remind you that papers read at our meetings are now eligible to compete for the Institution Medals.

I am sure Mr. Tarratt will not mind my referring to his Address to illustrate the trend of thought in the gas industry in 1903. He mentions that incandescent mantles were rapidly superseding flat flames everywhere, and that the newspapers were hailing the use of gas as a contribution to smoke abatement. The competition of inclined with horizontal retorts is referred to and the advent of verticals predicted. Mr. Tarratt discusses proposals for making low-quality gas and even mentions a gas-works where the carbonizing plant has been closed down and coke oven gas is in use. While fearing that Mond gas will prove a serious rival to town gas for power purposes, he apparently does not think it worth while to consider seriously electrical competition, except for lighting. Slot meter installations were becoming numerous, and the number of cookers in use was increasing rapidly. Advocating the installation of showrooms and advising increased service to the consumer, Mr. Tarratt's address was full of inspiration and optimism regarding the future prosperity of the gas industry, which has been fully justified.

Out of 180 names on our Roll only 31 were members in 1903, but I am glad to think that a number who attended that conference will be able to be with us again to-day, and if the works was then described as being "not modern but roomy and well equipped with plant of a work-a-day order," they will be pleased to know that, before he went to Newcastle some 10 years ago, Mr. Tarratt had fulfilled his ambition to modernize the works.

It may interest you to know that the amount of gas sold in Darlington, per annum, has more than doubled since 1903, while the amount of coal carbonized has only increased by one-seventh. Notwithstanding this, the saleable coke is 1 cwt. more per ton of coal; tar, 2 gallons more; and ammoniacal liquor practically double.

Difficulties of the Past.

The efficiency of the process of gas manufacture has now reached a very high standard, and it is, naturally, more scientific and complex than formerly. New and varied problems in connection with its distribution and application are continually

arising, so that we are, perhaps, inclined to think that the gas manager's occupation 27 years ago was comparatively simple. Yet he was faced with many difficulties which had to be solved practically unaided. For instance, there was no Federation of Gas Employers in existence, and wages and conditions of labour were ever-recurring subjects for local bargaining. The National Gas Council was not in being to safeguard the interests of the industry and offer legal advice to its members. Nor could he look to the British Commercial Gas Association for technical advice concerning distribution matters, take advantage of its publicity programmes, literature, or many other activities. The Special Purposes Section of this Association, which gives members the opportunity of meeting together to discuss their problems and is, incidentally, one of the cheapest and most profitable investments of a gas undertaking, was, I believe, not then in existence. The engineer of those days had not the advantage of having the results of many years' research work by the Institution and others. British Standard Specifications were unknown, and the design of plant was more a matter for individual effort. Great credit, therefore, is due to the men of the past generation, who are largely responsible for the present progressive state of the gas industry. May I take this opportunity to warn our younger members that, with all the existing organizations of which they can take advantage, they should not be content to be " spoon-fed," but think and act for themselves.

Mr. Tarratt called attention to the increasing difficulty in striking new ground for a Presidential Address. Now that some hundreds more have since been inflicted on the long-suffering gas industry, how much more difficult is the task! Yet there never was a time when our industry was faced with more numerous or more difficult problems, and although many of these have been ably dealt with recently by the Presidents of the Institution of Gas Engineers and the National Gas Council and by Presidents of our District Associations, I offer no apology for once more calling your attention to one or two matters of pressing importance.

What the Public Should Know.

I have referred to the progressive state of the gas industry. Although over 100 years old it was never more virile than to-day, and we of the industry find increased pleasure in our work because we know that in carrying it out we can give acceptable service to the community. It is for us to take every possible opportunity of enlightening the public in the matter.

In spite of the work of the " B.C.G.A." and others, we have, to a large extent, been too prone to assume that the man-in-the-street knows what we know: That gas lighting is kind to the eyes. It is the nearest approach to sunlight; that it assists to an appreciable extent in warming a room and, in so doing, ensures a definite ventilation; that there is now on the market a new and most reliable switch, operating with a by-pass, and, I am in a position to assure you, the elimination of the by-pass has recently become a practical proposition, so that it will shortly be possible to " switch-on " the gas as easily as electric light, thus making gas lighting the best and cheapest available.

We also know: That gas fires are not only clean and labour-saving, but they provide healthy, radiant heat, and ventilate as they warm; that food cooked in gas ovens is not in any way contaminated by the products of combustion. There is no limit to the number of cooking temperatures. The loss of weight is no more in a gas cooker than in any other oven with food cooked to the same degree; and, for quick service, gas cannot be equalled; that heat is most efficiently produced by combustion, and for every form of heat gas is the handiest and most economical fuel; that gas is a labour-saving luxury which even the poorest can indulge in.

Let us use every available means to disseminate this information by advertisement in newspapers, showrooms, on hoardings, and in many other ways, not the least important, through the medium of our own staff.

After all, how many people nowadays have money to burn? An electrical engineer of my acquaintance recently issued a circular intended to prove that electricity for heating and cooking was only one-and-a-half times as costly as gas.

From the relative prices of electricity and gas, however, it was obvious that if the conclusion was correct, gas appliances were only given credit for less than 30 p.ct. efficiency. I need scarcely remind you that they average over 60 p.ct., which would give a theoretical comparison of cost more nearly in keeping with the results of practical tests. But even if his arguments had been sound and figures correct, is it not still a matter for strong protest that such strenuous efforts are being made in many directions to induce people to change from gas to electricity when the vast majority are bound to live economically and have not an extra penny to spare for these necessities, and when gas can still give them satisfactory service?

It is not as if gas had failed them. What advantage does electricity offer for domestic use except its novelty and the convenience of the switch against the many advantages of gas I have enumerated? Everyone acknowledges that electricity has its uses and, for power purposes—when the price is low enough, it can scarcely be surpassed; but where gas can give equivalent service, the fact is beginning to be realized that it is folly for a corporation to spend large sums of capital in attempting to supersede it when capital is already invested in its own gas undertaking, or its citizens have invested their savings in the local gas company. In America it has long been recognized that both commodities have their uses, and in Chicago and other places where electricity is used so much more than in England the consumption of gas is also greater per head of the population than in any town in the British Isles.

Inequitable Flat Rate.

This, however, is partly due to the fact that it is recognized there that a flat rate is an inequitable charge. In fact, I believe one Judge has gone so far as to give his opinion that it is illegal to charge a flat rate for gas. There is no doubt that a considerable percentage of consumers whose consumptions are small are not paying their share of the working expenses and other charges for service. Yet, under existing legislation, the majority of undertakings are unable to offer inducements to consumers, by way of reduced rates, to use larger quantities of gas.

It is only right that the gas industry should be given the same freedom for charging as is enjoyed by electrical undertakings, and I am pleased to know that there is every likelihood of Parliament introducing a Bill with this object at an early date. If passed, there would then be, as you know, several methods of charging available; among others, the two-part charge, the block minimum charge, and the block rate charge. It seems to me that the last, which does not include a service charge, would be preferable as it is most easily applied to slot meters, where it would be difficult to collect a service charge and where a scale of increasing discounts would be all that was required.

With a fair field and no favour, the gas industry has no need to fear that its present useful service to the community will not be in greatly increasing demand in the future. The Darlington Gas Undertaking, at any rate, is more than holding its own against, I understand, the cheapest rates for electricity in the country, and the secret, I believe, of maintaining that hold will be " Service to the Consumer."

For your information, I give below the present charges for gas and electricity, and suggest that the price of gas is also one of the lowest in Great Britain.

Darlington Corporation.

Net Charges for Gas per Therm.

	d.
Lighting, domestic heating, cooking, &c.	6
,, over 200,000 c.ft. per quarter	5·55
Industrial purposes to 250,000 c.ft. per quarter	4·75
,, ,, over 250,000 c.ft. and under 1 million c.ft. per quarter	4·51
Industrial purposes, over 1 million c.ft. and under 4 million c.ft. per quarter	4·30
Industrial purposes, over 4 million c.ft.	4·09

Charges for Electricity per Unit.

Service charge, including meter rent . . . 2s. 3d. per quarter.

	March to Oct.	Nov. to Feb.
Lighting	½d.	3d.
Domestic heating, cooking, &c.	½d.	1½d.

All domestic purposes from 11 p.m. to 7 a.m., ⅜d. and time switch rental

Power—First 2000 units per quarter	1d.
Remainder	¼d.

Service to the Consumer.

Even in Darlington there was a time—happily in the distant past—when consumers' complaints were not taken very seriously and were given only scant attention.

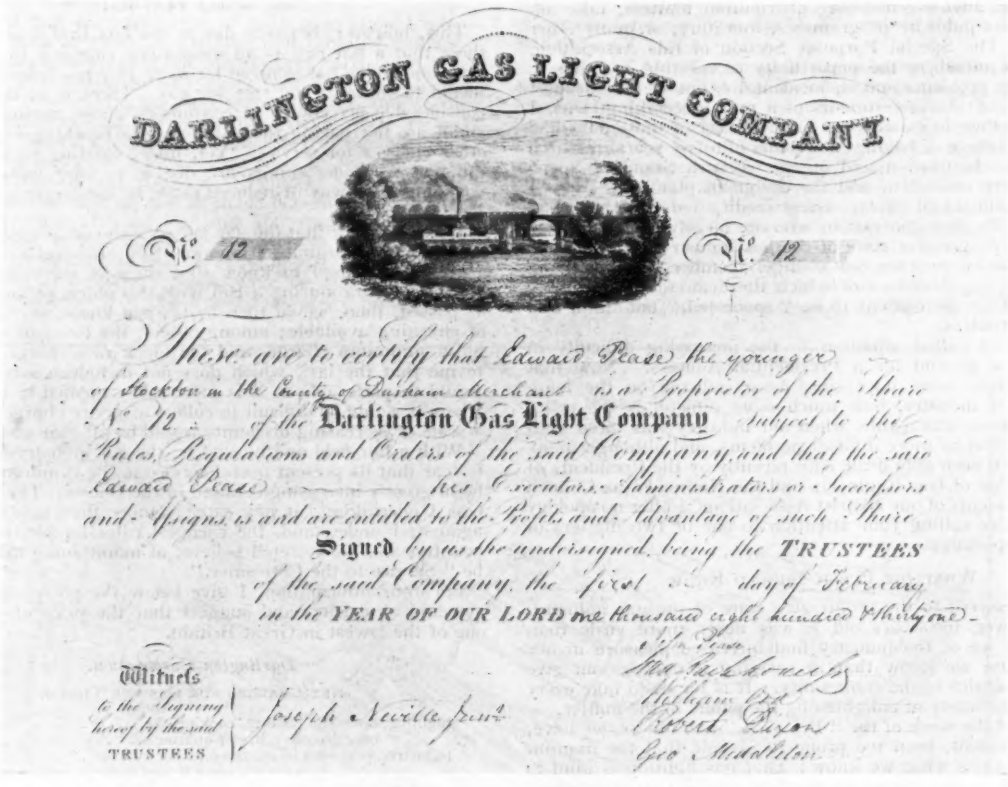
Every endeavour is now made to keep in touch with the consumer, and anticipate his requirements and complaints. All fixtures of cookers are followed up by our Lady Cookery Demonstrator. The whole of the slot consumers, who number about half the total, are visited periodically by our maintenance men, and a large number of ordinary consumers take advantage of our free maintenance scheme, which will shortly be extended to include the whole of our consumers. All gas fires are periodically inspected and cleaned. Meter inspectors are instructed to ask at every house whether the gas appliances are giving satisfaction. Once in three years every consumer's meter is tested *in situ*. Everything is done to see that our consumers are supplied with up-to-date, efficient, and economical appliances. Slot meter consumers who were previously obliged to purchase their own burners, usually cheap and wasteful, have, for several years, been supplied with efficient inverted burners, and all cookers brought in are re-fitted with open bars and new type burners. I believe that every cooker should have a flue pipe wherever possible, and these are now fitted to our cookers, whether ordinary or slot, with open tees to prevent the oven being affected by downdraught or excessive chimney pull. It is our practice to replace all noisy burners in gas fires which are brought into stock, and exchange, where necessary, obsolete fires.

The major portion of our consumers hire cookers from us, and a large number of old cookers have been replaced by those of the latest type, which is the only type now purchased. Since we are selling large numbers of all-enamelled cookers, and many consumers are prepared to pay for an exchange to the

very latest type on hire, there is a tendency to accumulate a stock of good, first-class cookers, of quite recent date. With the hotplates brought up-to-date, these are, therefore, being supplied with slot installations, or, with the green-enamelled exteriors replaced by mottled enamelled plates, they are being sold on hire purchase, at a reasonable price, to those who cannot afford to buy the all-enamelled article. The introduction of

The caterer or confectioner may use gas but probably not to the extent of the separate household. We must see to it, therefore, that gas is the fuel of the caterer, confectioner, and laundry, and, at the same time, seek to encourage the spirit of labour-saving in the home by demonstrating the advantages of gas for water heating.

I understand that, although gas is comparatively dear in


DARLINGTON GAS LIGHT COMPANY
No. 12
No. 12
These are to certify that Edward Pease the younger
of Stockton in the County of Durham Merchant is a Proprietor of the Share
No. 12 of the Darlington Gas Light Company subject to the
Rules, Regulations and Orders of the said Company, and that the said
Edward Pease his Executors, Administrators or Successors
and Assigns is and are entitled to the Profits and Advantage of such Share
Signed by us the undersigned being the TRUSTEES
of the said Company the first day of February
in the YEAR OF OUR LORD one thousand eight hundred & thirty one.
Witness
to the Signing
hereof by the said
TRUSTEES
Joseph Neville Junr
Edward Pease
Thos Richardson
Robert Dixon
Geo Middleton

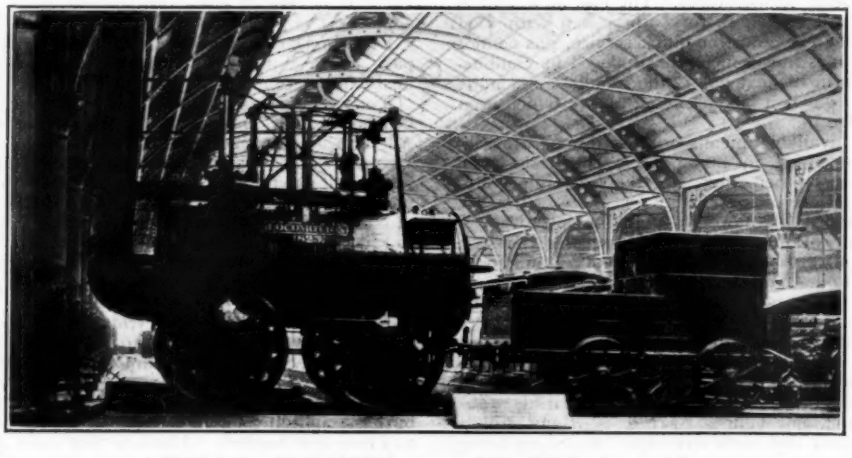
A FACSIMILE OF A SHARE CERTIFICATE HELD BY MR. EDWARD PEASE—1st FEBRUARY, 1831.

such a large quantity of efficient apparatus has, naturally, had its effect on the consumption of gas, per consumer, but I am convinced that it is a sound policy which will eventually benefit the Undertaking.

There are, I think, other reasons for a falling off in consumption per consumer over which the gas industry has no control. Apart from trade depression and shortage of money there are

America, it is in great demand for hot water installations and central heating, because of its convenience. It is in this direction that we must look for new business in the near future.

Darlington was one of the first Municipalities to own its Gas Undertaking, which was purchased in 1854 from a Company formed, I believe, in 1831. One of its original share certificates of that year bears an illustration of the gas-works nestling



ENGINE No. 1, "LOCOMOTION," AT DARLINGTON STATION.

many changes in domestic habits which denote the modern tendency to reduce labour to a minimum in spite of increased expense. Comparatively few now bake their own bread and many purchase from the confectioners ready-cooked food for dinner and cakes and pastries for tea. Cafés and restaurants are more largely patronized, and washing is sent to the laundry. The advent of the motor-car has caused the replacement of many a hot Sunday dinner by a cold picnic lunch.

below the railway and bridge over which, six years earlier, in 1825, No. 1 Engine ("Locomotion") now on Darlington Station platform, drew the first railway passenger train. The present gas-works occupies the same site, and the bridge, which was built by George Stephenson, is still to be seen.

The Darlington Works.

Since your last visit when the gasholder (No. 5) was in

course of erection, the remainder of the site, north of the railway, has been developed, gas being manufactured there and purified on the old site.

Gas has been manufactured in Darlington during the past 16 years almost entirely from unscreened Durham coal in continuous vertical retorts. During that period well over half-a-million tons of coal have been carbonized, and the gas made averages 79 therms per ton of 475 B.Th.U.

With the last extension the carbonizing plant is of ample capacity, but we have no water gas plant. This is exceptional for a works of 650 millions, and, although it would have been helpful during the coal strikes, I am of the opinion that there would be no advantage in installing such a plant at the present time.

Rather than give you the usual detailed description of the works, I propose to describe what may be of special interest during your visit and would refer you to the plans of the works which have been provided.

The retort house contains 12 settings of 8 Glover-West vertical retorts, 8 completed in 1914, 2 in 1924, and 2 in 1929. The 1929 extension of the house is prepared for 2 additional settings, the producers, flue walls, &c., being already built and requiring only the retort settings and ironwork to complete a further extension of one million per diem capacity. For the comfort of the stokers working on the top floor, a cold air douche plant provides cool air between each setting in very hot weather.

There are, including one almost completed, 3 Spencer-Bonecourt waste-heat boilers, with automatic water feed. No. 1 boiler has duplicate induced draught fans, driven by electric motor and vertical steam engine. No. 2 has duplicates driven by electric motor and steam turbine, and the steam main is coupled to the coke breeze-fired Lancashire boilers through a

In the stove-cleaning shop a spraying plant has been installed for painting cookers, fires, &c. In the old coke yard, outside the new stores, a "Sharman" main finder will be demonstrated during your visit.

The buildings in course of construction at Albert Road consist of new messrooms for the day workers and stokers, with lavatory and bath accommodation, and a large upper hall, which will serve as reading and recreation room and for other purposes.

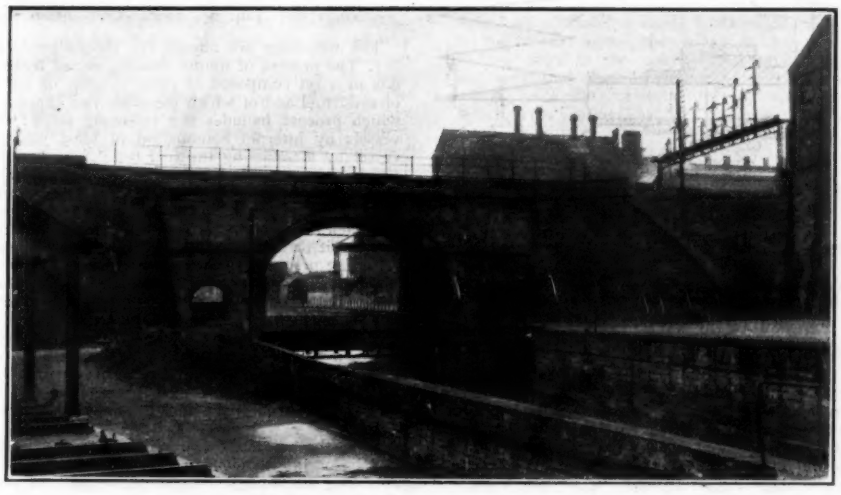
Improvements are being made to one of our coke screening plants where a rotary screen is being installed, and a new locomotive shed is also in course of erection.

At the main entrance, the old stores and gasfitters' shop are being converted into a suite of offices for the technical and clerical staff, testing room for gas appliances, and a small branch showroom.

I trust that you will all find something of interest and be favourably impressed during your visit to the works, and I should like to take this opportunity of acknowledging the encouragement and support I receive from my Chairman, Alderman Sir Chas. W. Starmer, and the members of my Committee, and the help given by the staff and workmen of the Department towards my efforts to maintain the works and undertaking in a high state of efficiency.

Vote of Thanks.

Mr. F. P. Tarratt, of Newcastle, proposed the vote of thanks to the President for his Address, and said that they all must greatly appreciate the work that Mr. Ruffhead had put into his paper. It was one to which they had listened with the keenest interest. When their President first came to Darlington, he came as Assistant Engineer, and when, later, he (Mr. Tarratt)



GEORGE STEPHENSON BRIDGE, DARLINGTON GAS-WORKS.

"surplus" valve, so that the steam may be used for assisting to drive the exhausters and other plant.

Coke is handled by means of skips, travelling on an endless ropeway beneath the retorts, and a telpher, which carries the skips to coke screens or yard. Coke is cut, when required, by a Cort's cutter and screened by rotary screens. Pan ashes are carried by the telpher to a storage hopper, and coke recovered by a "Columbus" separator. There is at present installed a "Holmes-Connersville" meter working in series with one of our station meters, as a check on its registration.

The four gasholders in use are:

"Cutler" triangulated steel frame in brick tank . .	1½ millions
Cast-iron column in brick tank	½ million
Spiral-guided in brick tank	¼ "
" " " steel tank	¼ "

The last, recently completed, was ordered for building in an existing brick tank which proved to be faulty. This was filled up, and, after consolidation, a ferro-concrete raft was laid over the filling and the tank erected and filled with water. Uneven settlement of the raft necessitated further delay for final consolidation, after which the tank was emptied, and lifted, the surface of raft levelled, the tank again lowered and the holder erected. I am pleased to say the raft shows no further signs of settlement.

The disused machine-stoked horizontal retort house, after demolishing chimney, filling in cellars, overhauling and reslating roof, glazing ventilator and all openings, has been transformed into a commodious general stores, gasfitters' and smiths' and repair shops. The stores are fitted with runways and lift to upper floor. The smaller disused retort house has recently been completed as garage with motor mechanic's repair shop.

had moved to Newcastle, he had had no hesitation whatever in recommending the Committee to appoint Mr. Ruffhead in his place. Darlington was a fortunate town in that it had always had a fine body of men controlling its interests; and whatever they had undertaken in municipal utility services had always been an unqualified success. Before he had left for Newcastle, he had spent 22 years in Darlington; and he numbered those years as among the finest in his life. During those years, the men who had been associated with the gas undertaking had always been a fine body. An outstanding personality had been Alderman Baron. His had been a forceful, yet sympathetic, character, and he had done a great deal for his town. Darlington had ever been fortunate in being able to supply gas at a low price. They had always had a keen competitor in electricity, but they had always recognized that there was a field for both electricity and gas. They would all agree with him when he said that Darlington had an excellent man in Mr. Ruffhead as their Gas Manager.

Mr. T. M. Waller, of Durham, seconded the proposal briefly, and expressed his appreciation of Mr. Ruffhead's Address.

The President, replying to the vote of thanks, said they would be pleased to note that they had with them at their meeting the President of the Institution of Gas Engineers; and he wished to offer him the opportunity of saying a few words.

Mr. H. E. Copp, of Hull, said that it had been a great pleasure to him to attend their meeting, and he had found the Presidential Address most interesting. He congratulated the members upon the activity of their Association.

The meeting then rose to visit the Gas-Works of the Darlington Corporation. Under the personal direction of Mr. Ruffhead and the works officials, the members were escorted round the various sections of the works and the showrooms.

REGISTER OF PATENTS

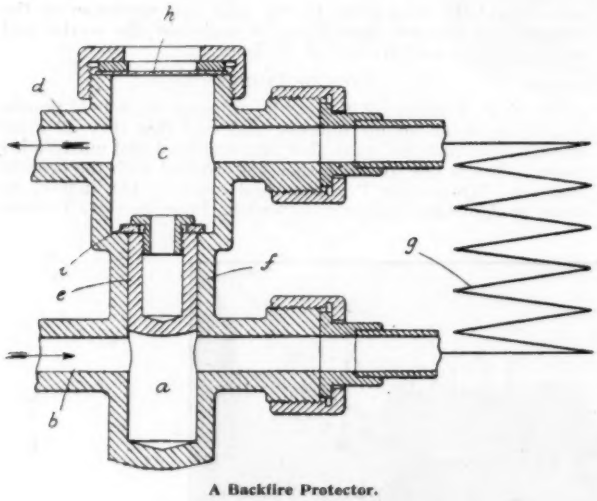
Protecting Gas Mains from Backfire. No. 334,129.

MANGIAMELI, F., of Düsseldorf.

No. 34,379; Nov. 11, 1929.

According to this invention, two portions of a gas main, one of which is located near the burner and the other of which is some distance therefrom, are connected together by a short length of piping which is located externally of the gas main and in which is fitted an obturating device which in the event of a backfire in the portion of the gas main located near the burner is displaced by the backfire pressure in such manner as to prevent further flow of gas through the portion of the gas main situated some distance from the burner.

The accompanying drawing, which is a vertical section, illustrates one form of construction of the invention. The chambers *a* and *c*



A Backfire Protector.

represent two integral parts of a gas main. The gas enters the chamber *a* through the inlet *b*, and then passes through the coil *g* to the chamber *c*, and then through the outlet *d* to the burner. The chambers *a* and *c* are connected together by a short length of piping *f* in which is fitted a piston *e*, which is a gas-tight fit in the cylinder. Movement of the piston under the action of gravity or owing to an accidental jar is prevented by means of a washer or diaphragm *i* of some soft or frangible material such as lead, rubber, or parchment, a screw-threaded plug fitted to the piston normally bearing against this washer or diaphragm. In the position shown in the drawing the piston does not obstruct the flow of gas from the chamber *a* to the chamber *c*.

If, however, a backfire occurs in the burner, the excess pressure exerted on the piston head at the chamber *c* causes fracture of the washer *i*, and the piston *e* is displaced in such manner as to prevent a flow of gas from the inlet *b* to the coil *g*, and the flame is extinguished. The piston can then be withdrawn and a new washer *i* fitted to the device. A diaphragm *h* or vent valve may be fitted to the upper part of the chamber *c*, which is provided with a removable cover.

Road Surfacing Material.—No. 334,336.

SOUTH METROPOLITAN GAS COMPANY and PICKARD, H., both of 709, Old Kent Road, S.E. 15.

No. 22,591; July 23, 1929.

This invention relates to a bituminous material suitable for application by spreading to a road foundation. A bituminous binder is made by dispersing coal in tar, the coal amounting to 18 to 25 p.ct. of the tar. The tar may contain additional pitch up to 25 p.ct. of its weight. The temperature of dispersion may be 250° to 300° C. The binder is mixed at a temperature of about 120° to 150° C. with hard stone ranging in size from ¾ in. to dust. The proportion of binder to stone and the proportion of stones of various sizes are such that the mixture has a hardness determined as follows:

The mixture is charged into a suitable mould and brought to a temperature of 60° C. A plunger of 1 in. diameter and a hemispherical end is held erect, with the said end downwards, on the surface of the mass, and weight is applied to the other end of the plunger, conveniently by a leverage system. When the weight is 100 lbs. the plunger should not sink at a rate greater than 1 in. per minute, and when the weight is 1500 lbs. the plunger should not sink at a rate lower than 1 in. in 10 minutes.

Carburetted Water Gas Manufacture. No. 334,485.

HUMPHREYS & GLASGOW, LTD., of Westminster (Assignees of H. G. TERZIAN, of Philadelphia).

No. 2762; Jan. 27, 1930. Convention date, July 11, 1929.

The following are among the claims made for this invention:

1. The process of manufacturing mixed hydrocarbon gas and water gas in a set composed of three vessels, of which one contains a bed of solid fuel and of which the other two contain heat storing material, which process includes the following steps: Preheating two of the vessels by internal combustion of blast gas generated in the third vessel by air-blasting the fuel bed; introducing a hydrocarbon alternately to one and then to the other of the preheated vessels, and passing the hydrocarbon through the other preheated vessel; passing at least a substantial portion of the hydrocarbon gas produced through the fuel bed; and extracting tar from the hydrocarbon gas before passing it through the fuel bed.

2. The process of manufacturing mixed hydrocarbon gas and water gas in a set comprising a generator, a carburettor, a superheater, a wash-box, a condenser, and a second wash-box, which process includes the following steps. Air blasting to incandescence a solid fuel bed in the generator, and storing heat in the carburettor and superheater; producing hydrocarbon gas by passing a fluid hydrocarbon alternately through the carburettor and superheater and through the superheater and the carburettor and then through the first wash-box and the condenser and through the fuel bed, and then through the second wash-box.

3. In the process of manufacturing mixed hydrocarbon gas and water gas according to claim 2, the additional step which consists in upsteaming the fuel bed in the generator to produce water gas, and simultaneously introducing a hydrocarbon to the superheater, conducting the hydrocarbon through the carburettor, mixing the water gas and the hydrocarbon in the top of the generator, and leading the mixed gas off through the second wash-box.

4. In the process of manufacturing a mixed hydrocarbon gas and water gas according to claim 2, by-passing a portion of the hydrocarbon gas from the first wash-box to the generator around the condenser.

Legal Intelligence

Arrest of Nottingham Gas Official.

On Wednesday of last week Leonard W. G. Ball, of the Nottingham Corporation Gas Department, together with a local builder, J. E. Allen, was brought before the City Magistrates on a charge of appropriating certain sums of money—to wit, £129 and £132—belonging to the municipality; accused were remanded for a week.

Mr. A. S. DRABBLE, the Corporation Solicitor, prosecuted, and intimated that only sufficient evidence would be called at that stage to justify a remand for a week. Investigations were proceeding, and would be of a most thorough character. The charges arose in relation to timber ordered by Ball through Allen, and which had been paid for by the Corporation but never delivered.

Detective-Sergt. Pierce gave evidence as to the arrest of Ball. He told him he was making investigations regarding prisoner's accounts as to certain timber which was paid for by the Corporation, but was not traced as having been received. Asked if he cared to give any explanation, Ball replied that he wanted to make a clean breast of it, and had told Mr. Wilkinson, the Gas Engineer, everything. Witness took down a statement at prisoner's dictation, and this was produced to the Magistrates, but not read. The statement was signed by Ball, who was shown two accounts, and told that the records of the Department had been searched, but no trace could be found of the goods. To this the accused replied: "I am sorry to say that the invoices are bogus. No such goods have been delivered." Witness afterwards saw Allen, and told him that Ball had been detained on two charges, and that he had made a statement which implicated him. Allen had said that Ball's statement was true.

Gas Acts (1920 and 1929) Orders.

SPECIAL ORDERS.

Maidstone Gas Company.

To modify various provisions connected with the Company's administration, &c.

Yeovil Corporation.

To extend the limits of supply, and for various other purposes.

DECLARATION OF CALORIFIC VALUE.

Sittingbourne and Milton Urban District Council.—475 B.Th.U. (Jan. 1, 1931.)

Rating a Gas Company

Questions of Profit

The Hertfordshire Assessment Appeals Committee some weeks ago had an exceptionally complicated case to consider in the appeal by the Watford and St. Albans Gas Company against the amount of the assessment of the gas undertaking in the rating area of St. Albans City and Rural District. The case took up the greater part of a two-days' sitting.

Sir JOSEPH PRIESTLEY, K.C., was in the Chair.

Counsel for Appellants were Mr. J. G. TRAPNELL and Mr. W. B. FRAMPTON (instructed by Messrs. Sedgwick, Turner, Sworder, and Wilson, Watford). The only Respondents were the Assessment Committee, represented by Mr. MALCOLM EVE and Mr. CAMPBELL LOW (instructed by Messrs. F. Beal and Son, St. Albans).

Mr. TRAPNELL, opening the case, said that an objection was made by the Gas Company on Sept. 27, 1928, in respect of a Valuation List intended to come into force on April 1, 1929. It was heard on Oct. 25, 1929, and resulted in the assessment being reduced from £6000 to £4000. The Gas Company were aggrieved by that decision, and on Nov. 12, 1929, gave notice of appeal. The appellants, Counsel stated, were aiming at a reduction of the rateable value of £4000 to £2520 or thereabouts. The real crux of the case, he maintained, was whether the Company had to be rated on the basis that its divisible profits were restricted—whether the hypothetical tenant had to be regarded as a person who would only pay a rent for the property with knowledge of and with the restrictions in mind—or whether the Committee or any Rating Authority could say that they could disregard the restrictions for the purposes of rating and look at the possible earning capacity of the Company and rate it high accordingly. The appellants maintained that that was what had been done by the Assessment Committee, and it was wrong.

Mr. *George Evetts,* Consulting Gas Engineer, of Palace Chambers, Westminster, the first witness, said he had endeavoured to ascertain what a tenant would pay to occupy these gas-works on a continuing tenancy, and he took the usual method of dividing the undertaking between two hypothetical individuals—the landlord and the tenant—on the assumption that the landlord built the works and laid the mains and service pipes up to the doors of the consumers in readiness for the tenant to come in and commence his business. The tenant then had to provide all the chattels—meters, cooking and heating stoves, horses and carts, service trucks, &c.—and run a hire-purchase business for selling articles on three years' purchase for the consumption of gas. The tenant had to provide a substantial working capital.

In reply to Mr. Trapnell as to what was the usual percentage allowed on tenant's capital, witness said that he had never had 15 p.ct. challenged since the introduction of the Rating and Valuation Act of 1925. He pointed out that the capital of the St. Albans Gas Company was extremely low per unit of gas sold, and as a result the consumer obtained gas at a comparatively low price.

Mr. *Thomas Charles Battersby,* Engineer to the St. Albans Gas Company, was called to give evidence of work in respect of the maintenance of the plant during the past five years.

Mr. *Edward Humphrey Noel Ryde,* of Westminster, said that he had surveyed the St. Albans Gas-Works and district, and prepared a valuation, based upon the 1928 accounts.

Mr. EVE submitted that the appellants had made out no case in law. His proposition in law was that the Court must, in dealing with the sliding-scale Company, ascertain what were the true profits of the concern for the year in question.

Sir *Herbert Trustram Eve,* Chairman of the Panel of Valuers for Hertfordshire under the Rating and Valuation Act, 1925, giving evidence, said he had had the duty of valuing all gas, water, and electricity undertakings in the county, and they had all been settled with the exception of this one. The argument between them on valuation was merely on certain items which should or should not be included among the working expenses. Witness went through the items in detail, and said that, on the figures, he considered an assessment of £4000 was very moderate.

Witness was cross-examined at considerable length by Mr. Trapnell.

DECISION FOR RESPONDENTS.

After a brief retirement, the Chairman announced that they were of the opinion that, having heard Mr. Evetts, Mr. Ryde, and Sir Trustram Eve, there were several items which should be written back to net profits and not charged against them. Mr. Ryde worked out £3520 as the figure for rateable value. If they wrote back anything more, like the items it was admitted should be written back, on top of that figure, they would be very near the figure of £4000.

They were of the opinion that this was the right figure. Having regard to the fact that they were satisfied that certain items, which were not admitted by the appellants for assessment, and which were claimed by Sir Trustram Eve as admissible for assessment, should be added to the sum from which deductions should be made for the purposes of revenue at the rateable value, they must dismiss this appeal, because the figure of £4000 was the figure which the Assessment Committee stated that they accepted.

The appeal was accordingly dismissed, with costs.

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GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The volume of business in Gas Stocks and Shares last week was a trifle heavier than of late, and prices remained firm. Debenture stocks were again in demand, and several showed improvements—viz., British 4 p.ct., 2 points to 72-75; Gas Light 3 p.ct. and 5 p.ct., a point each to 60-63 and 99-102 respectively; South Metropolitan 6½ p.ct., 1½ points to 99-102; and South Suburban, 2 points to 95-98. Among ordinary stocks, Brighton and Hove 5 p.ct. gained 1 to 101-104, and Liverpool 5 p.ct., following the increase of 3 points the previous week, rose another 1 to 94½-95½ at the local Exchange. Apart from *ex* div. markings, there were no reductions in value last week.

Turning again to debenture stocks, it is interesting to note to what extent these have improved since a year ago. The general preference for safety-first investments which has been prevalent for some time past has doubtless been the chief cause of the increase in the value of these securities, which under normal conditions vary but little. The following are some examples:

—	Quotations.		Increase over 1929.
	Oct. 2, 1930.	Oct. 4, 1929.	
Bournemouth 4 p.ct.	74—77	72—75	2
British 5 p.ct. red.	94—97	94—97	No change
Commercial 3 p.ct.	56—59	56—59	,,
Gas Light 3 p.ct.	60—63	55—58	5
,, ,, 5 p.ct. red.	99—102	97—100	2
South Metropolitan 3 p.ct.	59—62	54—57	5
,, ,, 6½ p.ct. red.	99—102	98—100	1½
Southampton 4 p.ct.	73—76	70—73	3
Sutton 5 p.ct.	93—96	90—93	3
Tottenham 4 p.ct.	75—78	74—77	1
Wandsworth 5 p.ct.	97—100	93—96	4

We are able to announce that the working agreement entered into between the South Metropolitan Gas Company and the Commercial Gas Company has now received the official approval of the Board of Trade. It will be remembered that one condition of the agreement is for the exchange of one-third (£691,093) of the Commercial ordinary stock by the holders thereof for £635,805 6 p.ct. irredeemable preference stock of the South Metropolitan Company in the proportion of £100 Commercial ordinary stock for £92 6 p.ct. South Metropolitan preference stock. The proprietors of the Commercial Company have, therefore, been invited to make application to exchange their holdings, or any portion thereof, the option to exchange being conditional on applications being received for the one-third Commercial capital mentioned above.

The present market value of the South Metropolitan 6 p.ct. preference stock is 108½, so that £92 stock is worth £99 16s. 5d., while the value of £100 Commercial stock is now £95 10s. With regard to dividends, the 6 p.ct. payable on the South Metropolitan preference stock is fixed and ranks prior to the dividend on the ordinary stock of that Company, whereas the 5 p.ct. basic dividend on the Commercial ordinary stock can only be increased above this rate if the average price received for gas is below the basic price of 11d. per therm. The Company has distributed 6 p.ct. per annum for the past three years.

Coal Markets.

There has been a certain small expansion in home trade due to seasonal conditions, but the export markets remain as lifeless as ever. Little change in this direction can be expected until more is known of the details of the marketing schemes, which presumably come into operation next month.

News from abroad is still uniformly depressing from the point of view of our export trade. The whole of the Finnish State railways order, of which Northumberland expects at least a share, was recently given to Poland, and at prices which are far below anything that Northumberland can touch. Germany is apparently still glutted with coal, and in spite of widespread dismissals of miners, production is in excess of requirements.

As regards gas coal, there is no change in the position. The extra demand naturally anticipated at this time of the year is not materializing, and prices are maintained only by adjustment of output. In the Newcastle market Wear specials are about 15s. to 15s. 3d. f.o.b., best qualities 14s. 6d. to 14s. 9d., and seconds 12s. 6d. to 13s. 3d. Yorkshire screened gas for export is 15s. to 16s. It is reported that the export subsidy is being withdrawn, but it is not clear what effect this will have on prices.

Gas coke is being well absorbed, both on home and export account, and is generally firm at about 21s. 6d.

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Oct.* 6.

The prices of tar products are as follows: Pitch, 47s. 6d. per ton f.o.b.; creosote for export, 6d. to 6½d. per gallon f.o.b.; pure toluole, about 2s. 2d. per gallon; pure benzole, 1s. 9d. to 1s. 10d. per gallon; 95/160 solvent naphtha, 1s. 5d. to 1s. 6d. per gallon; pyridine bases, about 3s. 9d. per gallon. All these prices are *ex* sellers' works.

Tar Products in the Provinces.

Oct. 6.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 24s. Pitch—East Coast, 46s. f.o.b. West Coast, Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7½d. to 1s. 8½d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 2½d. to 1s. 2⅝d. Heavy naphtha, North, 11d. to 1s. Creosote, in bulk, North, liquid and salty, 3½d. to 3⅝d.; low gravity, 1½d.; Scotland, 3¼d. to 3⅜d. Heavy oils, in bulk, North, 5½d. to 6d. Carbolic acid, 60's, 1s. 4½d. to 1s. 6d. Naphthalene, £10 to £12. Salts, £3 to £5, bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Oct.* 4.

Trading continues on a moderate scale with prices of almost all products easy in tone. Motor benzole and naphthas are quieter, as makers in this area have not yet reduced quotations to correspond with other districts.

Pitch.—Quotations remain in the neighbourhood of 45s. to 47s. 6d. per ton f.o.b. Glasgow. Home orders are scarce, with value at 45s. per ton f.o.r.

Refined tar to Ministry of Transport Specification is weak at 3d. to 3¼d. per gallon *ex* works.

Creosote.—Production is likely to increase with the making of pitch, but values are unchanged. B.E.S.A. Specification is 2⅞d. to 3¼d. per gallon; low gravity, 3d. to 3¼d. per gallon; and neutral oil, 3d. to 3¼d. per gallon; all in bulk f.o.r. works.

Cresylic.—Quotations have been reduced. Pale, 97/99 p.ct. is 1s. 6⅞d. to 1s. 7⅞d. per gallon; dark, 97/99 p.ct., 1s. 5⅞d. to 1s. 6⅞d. per gallon; and pale, 99/100 p.ct., 1s. 8⅞d. to 1s. 9⅞d. per gallon; all f.o.r. in buyers' packages.

Crude naphtha.—The tendency is lower, but supplies are not plentiful. To-day's value is 4d. to 4¼d. per gallon free on rails in bulk.

Solvent naphtha.—Few orders are passing and quotations are weak. 90/160 is 1s. 2½d. to 1s. 3d. per gallon and 90/190, 1s. to 1s. 0½d. per gallon.

Motor benzole.—Quoted price is round 1s. 5d. to 1s. 5½d. per gallon.

Pyridines are unchanged. 90/160 is 3s. to 3s. 3d. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.	s. d.	
Crude benzole	0 8	to 0 9	per gallon at works
Motor ,,	1 3½	,, 1 4½	,, ,, ,,
Pure ,,	1 8	,, 1 9	,, ,, ,,

Trade Notes.

Metropolitan-Vickers' Bristol Office.

We are asked to announce that from Oct. 3 the Bristol Office of Metropolitan-Vickers Electrical Company, Ltd., is 22, Victoria Street, Bristol. Telephone Nos. 6860/1.

Contracts Advertised To-Day.

Coal.

The Shipley Urban District Council Gas Department invite tenders for gas nuts. [Advert. on p. 106.]

Coke Breaking, &c., Plant.

The Gas Department of the Thornton Cleveley Urban District Council invite tenders for the supply and erection of a coke breaking, elevating, and grading plant. [Advert. on p. 106.]

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Oct. 3	Rise or Fall on Week.	Transact'ns Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Aug. 14	5	5	Aldershot 5 p.c. max. C. .	78—78	..	78
522,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	68—71	..	70
1,551,868	,,	Apl. 8	7⅞	7⅞	Alliance & Dublin Ord. . .	96—99	..	97
374,000	,,	July 10	4	4	Do. 4 p.c. Deb. . . .	60—63	..	63
522,655	,,	Aug. 28	7	7	Barnet Ord. 7 p.c.	106—109	..	..
300,000	1	Apl. 24	1/4⅛	1/7⅛	Bombay, Ltd	16/- 18/-	..	16/6
174,500	10	Aug. 14	9	9	Bournemouth 5 p.c. . . .	14—15	..	..
500,050	10	,,	7	7	Do. 3 7 p.c. . . .	12½—12⅝	..	..
439,160	10	,,	6	6	Do. Pref. 6 p.c. .	10⅝—11⅛	..	11⅛
50,000	Stk.	June 26	3	3	Do. 3 p.c. Deb. .	55—58	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb. .	74—77	..	..
357,900	,,	Aug. 28	7½	7½	Brighton & Hove 6 p.c. Con.	112—117	..	..
871,880	,,	,,	6½	6½	Do. 5 p.c. Con.	101—104	+1	..
1,287,500	,,	July 24	5	5	Bristol 5 p.c. max. . . .	89¼—90¼a	..	..
855,000	,,	Sept. 25	8	7	British Ord.	108—113	..	111¼
100,000	,,	June 26	7	7	Do. 7 p.c. Pref. . . .	112—117	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. .	72—75	+2	..
450 000	,,	,,	5	5	Do. 5 p.c. Red. Deb. .	94—97	..	..
100.000	,,	June 26	5	5	Cambridge 5 p.c. Deb. . .	94—97	..	..
100,000	10	May 22	6	10	Cape Town, Ltd.	9—10	..	..
100,000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref. . .	6⅞—7⅛	..	6⅞—7⅛
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb. . .	71—76	..	74
626,860	,,	July 24	6	6	Cardiff Con. Ord.	94—97	..	..
287,860	,,	June 26	7½	7½	Do. 7½ p.c. Red. Deb. .	97—100	..	..
157,150	,,	Aug. 14	6½	5	Chester 5 p.c. Ord.	86—91b	..	..
98,936	1	May 8	†2/-	†2/-	Colombo, Ltd. Ord. . . .	33/—35/-	..	..
24,500	1	,,	1/4⅛	1/4⅛	Do. 7 p.c. Pref. . .	18/6—20/6	..	..
609,204	1	Apl. 3	1/9⅜	1/9⅜	Colonial Gas Assn. Ld. Ord	17/—19/-	..	17/—17/3
296,053	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	19/—21/-	..	..
2,073,280	Stk.	July 24	7	6	Commercial Ord.	94—97	..	94 96
475,000	,,	June 26	3	3	Do. 3 p.c. Deb. . .	56—59	..	..
787,560	,,	Aug. 14	7	7	Croydon sliding scale . .	104—107	..	106—107
453,100	,,	,,	5	5	Do. max. div. . . .	81—84	..	..
542,270	,,	Aug. 14	10	7	Derby Con.	115—125e	..	..
55,000	,,	June 26	4	4	Do. Deb.	65—70e	..	..
209,000	,,	Aug. 28	5	5	East Hull Ord. 5 p.c. . .	69—71	..	..
1,002,180	,,	Sept. 25	†7g	†4	European, Ltd.	108—118*	..	110—114
18,629,125	,,	July 24	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	18/9—19/3f	..	18/9—19/1½
2,600,000	,,	,,	8¾	8¾	Do. 3½ p.c. max. . . .	63—65	..	63—64½
4,157,020	,,	,,	4	4	Do. 4 p.c. Con. Pref. . .	78—81	..	78¾—79½
5,602,620	,,	June 26	3	3	Do. 3 p.c. Con. Deb. . .	60—63	+1	60½—62¼
2,542,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. . .	99—102	+1	100½
161,480	,,	Sept. 11	10	10	Harrogate Cons. 10 p.c. max.	155—160	..	..
82,500	,,	Aug. 28	7	7	Hastings & St. L. 5 p.c. Conv.	97—102	..	..
258,740	,,	,,	5¼	5¼	Do. 3½ p.c. Con v.	76—81	..	78
70,000	10	May 22	†10	1	Hongkong & China, Ltd. .	13¾—14⅛	..	13¾—14⅛
213,200	Stk.	Aug. 14	6	6	Hornsey Con. 5½ p.c. . . .	88—91	..	91
2,438,594	,,	May 22	10	25	Imperial Continental Cap. .	335—355	..	335—345
228,180	,,	Aug. 14	8½	8½	Do. 3½ p.c. Red. Deb.	50—55	..	..
235,242	,,	Aug. 14	8½	8½	Lea Bridge 5 p.c. Ord. . .	128—128	..	..
2,145,907	,,	Aug. 14	6	6	Liverpool 5 p.c. Ord. . . .	94½—95½b	+1	..
600,000	,,	Sept. 25	7	7	Do. 7 p.c. Red. Pref. .	97¼—99½b*	..	..
165,736	,,	Aug. 28	8	9	Maidstone 5 p.c. Cap. . .	120—125	..	..
69,480	,,	June 26	3	3	Do. 3 p.c. Deb. . . .	51—54	..	..
75,000	5	June 26	†10	†10	Malta & Mediterranean . .	6¼—6	..	..
392,000	—	Oct. 1	5½	5½	Metrop'litan (of Melbourne) 5½ p.c. Red. Deb. . . .	88—91*	−2	..
675,000	Stk.	May 22	†6	†8	Montevideo, Ltd.	105—110	..	105
3,061,315	,,	July 24	5⅜	5	Newcastle & Gateshead Con.	15/9—16/3d/	..	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref. .	71½—72¼d	+1	..
691,705	,,	June 26	3½	3½	Do. 3½ p.c. Deb. .	66¾—67¾d	..	..
169,940	,,	Aug. 28	7½	7½	North Middlesex 6 p.c. Con.	106—111	..	..
396,160	,,	Aug. 14	5	5	Northampton 5 p.c. max. .	76—81	..	..
300,000	,,	Apl. 24	9	7	Oriental, Ltd.	108—113	..	110¼
60,000	5	13 My., '15	—	—	Ottoman	0—¼	..	..
205,162	Stk.	June 26	8	8	Plym'th & Stonehouse 5 p.c.	110 - 115	..	..
424,416	,,	Aug. 28	8	8	Portsm'th Con. Stk. 4 p.c. Std	107—112	..	..
241,446	,,	,,	5	5	Do. 5 p.c. max. . .	77—80	..	..
186,000	100	June 2	4	4	Primitiva 4 p.c. Red. Deb. .	96—99	..	..
677,837	Stk.	July 24	4	4	Do. 4 p.c. Red. Deb. 1911	81—84	..	..
371,496	,,	June 26	4	4	Do. 4 p.c. Cons. Deb. .	81—84	..	..
150,000	10	Sept. 25	6	6	San Paulo 6 p.c. Pref. . .	8½—8⅝*	..	8½—8⅝
1,736,968	Stk.	Aug. 28	6½	6½	Sheffield Cons.	100—103e	..	..
95,000	,,	July 10	4	4	Do. 4 p.c. Deb. . . .	76—78e	..	..
90,000	10	June 5	†4	‡5	South African	4—6	..	..
6,709,895	Stk.	Aug. 14	7½	5	South Met. Ord.	102—104	..	102—103½
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	107—110	..	..
1,895,445	,,	July 10	3	3	Do. 3 p.c. Deb. . . .	59—62	..	61—62
734,000	,,	Sept 11	6½	6½	Do. 5½ p.c. Red. Db.	99—102	+1¼	101⅜—101½
91,500	,,	Aug. 14	8½	8½	South Shields Con. . . .	103—104d	..	..
1,543,795	,,	July 24	6½	6½	South Suburban Ord. 5 p.c.	100—103	..	101—102½
468,837	,,	June 26	5	5	Do. 5 p.c. Deb.	95—98	+2	94½—96
647,740	,,	Aug. 28	5	5	Southampton Ord. 5 p.c.max.	75—78	..	77
121,275	,,	June 26	4	4	Do. 4 p.c. Deb.	73—76	..	..
179,014	,,	July 24	8	8	Sutton Ord.	110—113	..	..
94,500	,,	June 26	5	5	Do. 5 p.c. Deb. . . .	93—96	..	..
250,000	,,	Aug. 28	7	7	Swansea 7 p.c. Red. Pref. .	98—101	..	..
200,000	,,	June 26	6½	6½	Do. 6½ p.c. Red. Deb. .	98—101	..	..
1,076,490	,,	July 24	6⅝	6⅝	Tottenham District Ord. .	102—106	..	103½—104
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. . .	95—98	..	..
199,005	,,	June 26	4	4	Do. 4 p.c. Deb. . .	75—78	..	..
182,880	10	30 Dec., '12	—	—	Tuscan, Ltd.	3⅜—4⅜	..	..
85,701	Stk.	Sept. 25	6	6	Do. 6 p.c. Red. Deb.	78—78*	..	..
309,094	,,	Aug. 28	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	95—100	..	..
88,330	,,	,,	5	5	Do. 5 p.c. pref. . .	85—90	..	..
1,180,970	,,	July 10	—	7	Wandsworth, Wimbledon, and Epsom Cons. . .	107—112	..	110—110½
200,000	,,	,,	5	5	Do. 5 p.c. Pref. . . .	89—92	..	90—90½
488,344	,,	June 26	5	5	Do. 5 p.c. Deb. . . .	97—100	..	98½—99½

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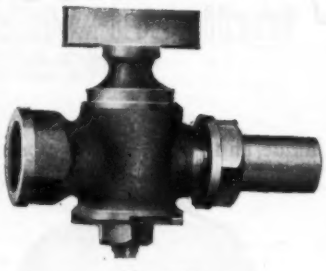

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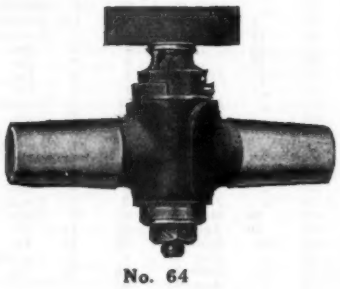

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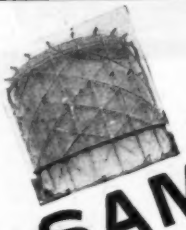

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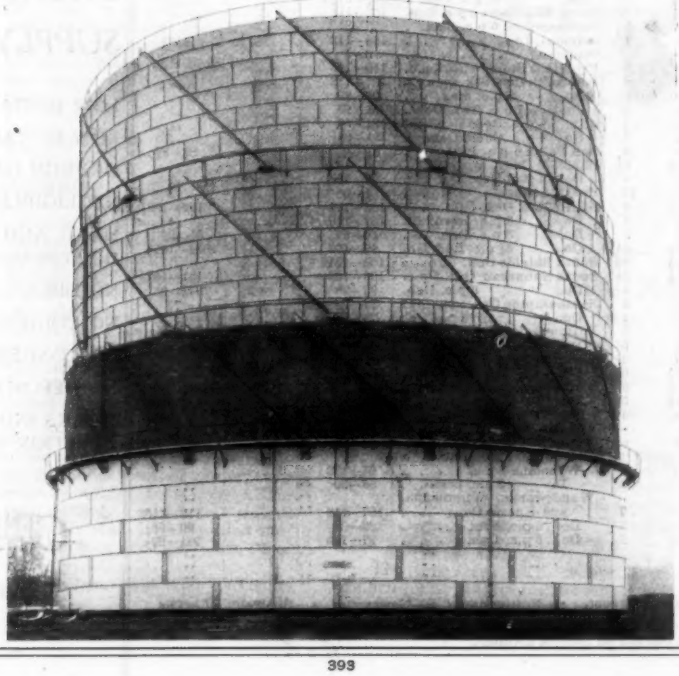

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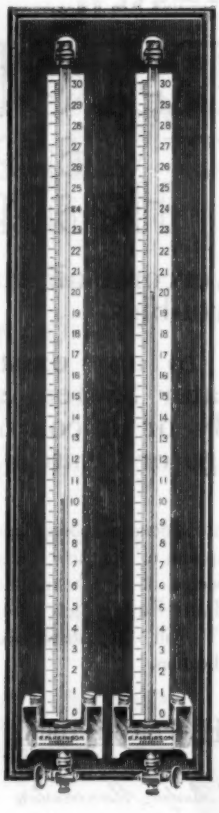

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